Systema Agriculturæ;

The MYSTERY of

HUSBANDRY

DISCOVERED:

Treating of the several New and most Advantagious Ways

OF

Tilling, Planting, Sowing, Manuring, Ordering, Improving

Of all sorts of

GARDENS, ORCHARDS, MEADOWS, PASTURES, CORN-LANDS, WOODS & COPPICES.

As also of

FRUITS, CORN, GRAIN, PULSE, NEW-HAYS, CATTLE, FOWL, BEASTS, BEES, SILK-WORMS, *&c.*

With an Account of the several *INSTRUMENTS* and *ENGINES* used in this PROFESSION.

To which is added

KALENDARIUM RUSTICUM:

OR,

The HUSBANDMANS Monthly Directions.

ALSO

The PROGNOSTICKS of *Dearth, Scarcity, Plenty, Sickness, Heat, Cold, Frost, Snow, Winds, Rain, Hail, Thunder*, &c.

AND

DICTIONARIUM RUSTICUM:

OR,

The Interpretation of RUSTICK TERMS.

The whole WORK being of great Use and Advantage to all that delight in that most NOBLE PRACTICE.

The Second Edition, *carefully Corrected and Amended; with many large and useful Additions throughout the whole Work: By the* Author.

Published for the Common Good: By *J. W.* Gent.

Virgil. *O fortunatos nimium, sua si bona norint, Agricolas.*-----

LONDON: Printed by *J. C.* for *T. Dring*; and are to be sold by *Charles Smith* and *Tho. Burrell*, at the *Angel* neer the Inner-Temple-gate, and the *Golden Ball* under St. *Dunstans* Church in *Fleet-street*. 1675.

~~7076. h. 21.~~
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7076 f h 21

THE EXPLANATION OF THE Frontiſpiece.

Firſt caſt your Eye upon a Ruſtick Seat,
Built ſtrong and plain, yet well contriv'd, and neat;
And ſcituated on a healthy Soyl,
Yielding much Wealth with little coſt or toyl.
Near by it ſtand the Barns, *fram'd to contain*
Enriching ſtores of Hay, Pulſe, Corn *and* Grain;
With Bartons *large, and places where to feed*
Your Oxen, Cows, Swine, Poultry, *with their breed.*
On th'other ſide, hard by the Houſe, you ſee
The Apiary *for th' induſtrious* Bee.
Walk on a little farther, and behold
A pleaſant Garden *from high Windes and Cold*
Defended (by a ſpreading fruitful Wall,
With Rows of Lime *and* Fir-trees *ſtreight and tall,)*
Full fraught with neceſſary Flow'rs *and* Fruits,
And Natures choiceſt ſorts of Plants *and* Roots.
Beyond the ſame are Crops of Beans *and* Peaſe,
Saffron *and* Liquorice, *or ſuch as theſe;*
Then Orchards *ſo enrich'd with fruitful ſtore,*
Nature could give (nor they receive) no more:
Each Tree *ſtands bending with the weight it bears,*
Of Cherries *ſome, of* Apples, Plums *and* Pears.
Not far from thence ſee other Walks *and* Rows
Of Cyder-fruits, *near unto which there flows*
A Gliding Stream: *The next place you diſcover,*
Is where St. Foyn, La Lucern, Hops *and* Clover
Are propagated: Near unto thoſe Fields
Stands a large Wood, Maſt, Fewel, Timber *yields.*
In yonder Vale, hard by the River, *ſtands*
A Water-Engine, *which the Winde commands*
To fertilize the Meads; *on th' other ſide*
A Perſian Wheel *is plac't, both large and wide,*
To th' ſame intent: Then do the Fields *appear*
Cloathed with Corn *and* Grain *for th' enſuing Year.*
The Paſtures *ſtockt with* Beaſts, *the* Downs *with* Sheep;
The Cart, *the* Plough, *and all good order keep;*
Plenty *unto the* Husbandman, *and Gains*
Are his Rewards for's Induſtry and Pains.
Peruſe the Book; for here you only ſee
The following Subject in Epitome.

Printed for Tho. Dring at y. Corner of Chancery lane in Fleetstreet. 1675.

BRITISH MUSEUM

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BRITISH MUSEUM

TO THE

GENTRY

AND

YEOMANRY

OF

ENGLAND.

SIRS;

TO you formerly was Dedicated the First Edition of this succeeding, though then imperfect Tract; and for your sakes principally did it then submit it self to the Censure of this Critick Age. It's now a bad time for so mean and Rustick a Subject to appear again, when every Shop and Library is repleat with the Fruits and Labours of the most Acute Wits. Yet I hope it may obtain a better Welcome than heretofore, being Revised and Corrected, in many places Enlarged, and many new and necessary Experiments and Observations added: You also being every day more and more addicted to this Noble, though heretofore neglected Science; as is manifest from the Effects in most places discernable: It being easie for a Passant Traveller to distinguish the Villa's of the Ingenious from the Slothful, by the Improvements made in them; some being well Manured, and Planted with many curious Plantations of Fruit, and Avenues of Timber and other Trees, when others are bare and naked,

to the ſhame and Ignominy of their Owners. I hope what I formerly wrote on this Subject, might be ſome inducement towards ſuch improvement, amongſt the many Elaborate and more Excellent Works: And I queſtion not but this Second Edition, ſo much Enlarged, may more encourage and aſſiſt you in the Culture of your Farms *to your beſt advantage, in the propagating and encreaſing of ſuch things that may moſt retaliate your* Coſt *and* Induſtry, *and moſt improve your* Lands, *not only for the benefit of your* ſelves *and* Poſterity, *but the* Kingdom *in general; The ſeveral* ways *and* means *to accompliſh the ſame, being here preſented to your view, well Pruned and Advanced. For which end, and no other, theſe* Experiments *and* Obſervations *have formerly been not with a little care compoſed, and contracted into ſo* convenient *and* brief *a* Method, *and in ſuch a* familiar Stile, *ſuitable to the apprehenſions of* thoſe *they moſt concern; and now alſo made more uſeful, that they may anſwer your Expectation; which is the deſire of*

J. W.

Virgil. ------ Laudato ingentia Rura,
Exiguum colito.------

PROOEMIUM

IN LAUDEM

AGRICULTURÆ;

BEING

The PREFACE or INTRODUCTION

TO THE

WORK:

Shewing the EXCELLENCY, UTILITY, and NECESSITY of

HUSBANDRY.

THIS is an Age, wherein to commend or extol an *Ingenious Art* or *Science*, might be esteemed a needless labour, especially in a Country so highly improved in every thing; but that we finde the more Noble, Advantagious, Useful or Necessary any *Art*, *Science*, or *Profession* is, the stronger Arguments are framed against it; and more particularly against this *Rustick Art*, and its infinite Preheminencies and Oblectations, by the vainer and more *Pedantick* sort of persons, despising the worth or value of what they are ignorant of; who judge it below their *Honour* or *Reputation*, to take any notice of so mean a *Profession*; that esteem the Country no other than a place for Beasts, as Cities for men. This makes us tread in the steps of more Worthy *Rustick Authors*, and give a short *Preface*, not to seek Credit of the *Envious*, but to satisfie or confirm the *Ingenious* of the *Excellency* and *Inestimable value* of this *Art*, not only for the exercise and health of our Bodies, the increase of our Fortunes, and our Universal benefit, use and advantage, but also for the tranquility and peace of our Minds, and improving our

Underſtandings; which they will aſſuredly finde doth proceed from ſuch Noble, pleaſant and neceſſary *Enterpriſes*. If they diligently read and peruſe the Ancient Writers, they may obſerve that many Wiſe and Learned Men, worthy of praiſe, were exceedingly delighted, not only in a *Rural Habitation*, but did alſo exerciſe themſelves in *Tilling the Earth*: That the Study of *Agriculture* was of ſo high an eſteem, and ſo worthy of honour, that *Poets*, *Philoſophers*, *Princes*, and *Kings* themſelves, did not only acquire an Honourable and an Immortal Name, by their *Writings* and *Precepts* in this *Art* left to Poſterity; but have alſo diligently performed the Office of a Countryman, and wrought with their own hands, and obtained thereby not a little Fame and Renown. For which cauſe, *Xenophon* in his Elegant Tract of *Oeconomicks* tells you, *That nothing can be of a more Regal* (or Noble) *Eſtimation and Splendour, than Judicious* Agriculture. *Socrates* alſo gives you a Relation, how *Cyrus*, that moſt Renowned King of *Perſia*, a Man of a Sublime VVit and moſt Illuſtrious Fame, when *Lyſander* of *Lacedemonia*, a Man endowed with excellent Vertues, came and brought him Preſents; At a certain time, for their Recreations, he conducted *Lyſander* into his Garden, on every ſide incloſed with a Noble Fence, and cultivated with moſt curious Art and ſingular Induſtry. Then *Lyſander* (admiring the compleat order of every thing, and the height of the Trees planted in ſuch direct lines, and every way lineal, the *Earth* adorned with Plants, the fairneſs of the Fruits, the beauty and order of the pleaſant and fragrant Flowers) ſaid, *That he did exceedingly admire, not ſo much at the Study and Diligence, as the Induſtry and Ingenuity of the Workman, by whom the ſame was ſo Artificially ordered and contrived.* Then *Cyrus* being well pleaſed with the praiſe and commendation of his VVorkmanſhip, anſwered Lyſander: *All theſe things were performed by my own Induſtry; theſe curious Orders were by me delineated; theſe Trees, Plants, Flowers, and all theſe things thou ſo admireſt at, were all planted and performed by my*

own hands. Then *Lyſander* beholding his Purple Habit, the Excellency of his Perſon, and his *Perſian* Ornaments glittering with Gold and Precious Stones, ſaid: *O* Cyrus! *how deſervedly may you of all men be eſteemed happy, ſeeing ſo high an Honour and Fortune is conjoyned and united with ſo Excellent a Spirit!*

Pliny writes, that the *Romans* had ſo high an eſteem for *Agriculture*, that their Laws did extend to the Reformation of the negligences and abuſes in the exerciſe of that neceſſary and *Honourable Art.* The ſame Author brings ſeveral Preſidents of many worthy and honourable Perſons that addicted themſelves unto, and affected this Art; and highly ſets forth the praiſe and commendation thereof; and ſhews how the Ancient *Romans* did execute their *Ruſtick Laws*, and incouraged the induſtrious and ingenious Husbandman: As by the example of *C. Furius Creſinus*, who out of a ſmall piece of Ground gathered much more Fruits and Profits, than his Neighbours about him out of their great and ample Poſſeſſions; which highly contracted their envy and hatred againſt him, inſomuch as they accuſed him, that by Sorcery, Charms, and VVitchcraft, he had tranſported his Neighbours Fruits, Fertility and Increaſe, into his own Fields: For which he was ordered by *Spurius Albinus* peremptorily to anſwer the matter. He therefore fearing the worſt, at ſuch time as the *Tribes* were ready to give their Voices, brought into the common place his Plough, and other *Rural* Inſtruments belonging to *Agriculture*, and placed them in the open face of the Court. He ſet there alſo his own Daughter, a luſty ſtrong Laſs, and big of bone, well fed, and well clad; alſo his Oxen full and fair: Then turning to the Citizens of *Rome*, *My Maſters* (quoth he) *theſe are the Sorceries, Charms, and all the Inchantments that I uſe: I might alſo alledge my own Travel and Toil, my early riſing, and late ſitting up, and the painful ſweat I daily endure; but I am not able to preſent theſe to your view, nor to bring them with me into this Aſſembly.* Which when the people had heard, they unanimouſly pronounced him *Not*

Guilty, and he was highly commended of all perſons for his Ingenuity and Induſtry.

It is moſt evident, that this Art of *Agriculture* doth not require ſo great charge and expence, as it doth judgment, labour and induſtry; which to poſſeſs men withal, and incourage them unto, is the intent and ſcope of our Learned, both Ancient and Modern Authors, that we may not ſpend the beſt of our times in the moſt vain, coſtly, unneceſſary and trifling Studies and Affairs; for in former times (*Cato* teſtifies) he was highly commended and praiſed that was eſteemed a good Husband. It cannot be thought that ſo Learned and Wiſe Men could ſet ſo high a value and eſteem upon this Art of *Agriculture*, but upon very ſolid and weighty grounds and reaſons. Not to ſpeak of the various Delights, Pleaſures and Contents that theſe *Ruſticities* plentifully heap upon us, they ſupply us for our neceſſities and advantages; for without this Art none in *City* or *Country* could ſubſiſt: as the Mother ſuckles the Infant with her Milk, ſo doth the Earth, the Mother of us all, univerſally feed and nouriſh us at an eaſie, liberal, and profitable rate; whereof we have daily experience, that our induſtry, labour and coſts, are returned upon us, with a manifold increaſe and advantage, unleſs the Celeſtial influences impede. *Chryſoſtom* alſo ſhews how neceſſary the Art of *Agriculture* is (when enumerating the ſeveral advantages of *Mechanick* Arts) at length concludes, that this Art is by far more worthy, excellent and neceſſary, than all the other. We all know how ill we can ſubſiſt without Garments, and other neceſſaries of that nature; but without the Fruits, and other increaſe of the Earth, we cannot live. The *Scythians*, *Hamaxobians*, and *Gymnoſophiſts*, eſteemed all other Arts as vain and unprofitable; but this Art of *Agriculture* they accounted the only neceſſary for humane life; they exerciſed and applied all their induſtry, ingenuity, practiſes and ſtudies, principally to this only Art.

Romulus and *Cyrus* knowing the neceſſarineſs and uſefulneſs of this Art above all other Exerciſes and

Arts,

Arts, did first Institute or introduce their Subjects in Military Affairs and *Agriculture*, judging these only sufficient to preserve and defend them from the injuries of others, and to sustain their lives. We also read, that the *Helvetians* or *Switzers*, a very Wise People in their management of Affairs, inhabit or possess about one hundred Towns, out of which they yearly send a thousand chosen men into their Army, the rest remain behinde to Till the Ground. The next year some of them that staid go forth to the War, the other return; by which means they are as well exercised in War as in Husbandry. It is also noted of *Romulus*, that he used to prefer *Husbandmen* above *Citizens*, esteeming those that lived in Towns with their wealthy Stocks and Trade, not equal nor worthy of compare with those that Tilled the *Land*, and wearied themselves daily in Rustick Exercises. The *Romans*, when they gave names to their Tribes, called the chiefest of the States the *Rustick Tribes*, and the meaner in degree the *Urbane*. *Pliny.*

Numa Pompilius, to incourage *Agriculture*, commanded the Fields to be divided into a certain number of Villages, in each of which he constituted a *Supervisor*; whose principal Office it was to observe and enquire, who diligently and industriously did Till their Land, and who neglected it, whose Names were brought unto him. He oftentimes called for the *Industrious Husbandman*, and courteously received him, and sometimes dismissed him with Noble *Gratuities*: And contrariwise, the idle and slothful he rebuked; whereby some for fear of shame and disgrace, the rest in hope of favour and reward, were all continually intent on their Affairs, that they might render themselves and their Lands praise-worthy to their King: A Worthy and Noble President for the incouragement of our English *Husbandmen* that are Ingenious and Industrious, and for the Regulation and Reformation of the infinite abuses, injuries and neglects, so frequently committed and suffered in every Village, by the slothful, ignorant, and envious *Rustick*. The like examples we finde

finde to be in ſeveral Countries, as *Spain*, *Germany*, *Venice*, *Holland*, &c. of Compulſive Laws, and excellent Cuſtoms for the propagation of Trees for Timber, and for Fruits. In *Burgundy*, where Wallnut-Trees abound, whenever they fell a Tree, they always plant a young one near that place: And in ſeveral places betwixt *Hanaw* and *Francfort* in *Germany*, no young Farmer is permitted to Marry a Wife, till he bring proof that he hath Planted, and is a Father of ſuch a ſtated number of Wallnut-Trees; which Law is inviolably obſerved to this day. It hath been a long time deſigned, and attempted by ſeveral VVorthy Perſons, Affecters of Ingenuity, and the Publick Good of the Kingdom, that there might be ſome Conſtitutions or Orders for the advancing and propagating of this Noble Art, eſpecially that part relating to the increaſe and preſervation of Timber and Fruit-Trees; and that there might be Judicious and Experienced *Superviſors* in every place for that purpoſe. I muſt needs confeſs we have ſeveral good Laws relating to our Rural Affairs, but none more ſlighted nor neglected than thoſe. Our hopes and expectations are now great, that ſomething will ſhortly be done therein, ſeeing that Royal and moſt Excellent Society at *Greſham-Colledge*, make it one of the moſt principal *Objects* of their Studies and Care; it being ſo Univerſally neceſſary for our well-being and preſervation, if not the moſt neceſſary, all things conſidered.

Sylva.

Maximus Tyrius, a moſt Grave *Philoſopher*, compoſed a Dialogue, wherein, with many ſufficient and firm Reaſons, he demonſtrates, that this Art of *Agriculture* hath the Precedency of, and is more neceſſary than the *Military*; and Elegantly and Learnedly diſcuſſeth many things, and very much of the profits and advantages of the *Ruſtick Art*, and *Rural Affairs*.

As to its Antiquity, no Art or Science can precede it; every one knows that a Country-life was the moſt Ancient, and that men did in the Infancy of time inhabit in Country-Habitations, and ſuſtained themſelves by the Fruits of the Earth, and dwelt in Tents, Woods, *&c.* inſtead of Houſes.

As

As to the ſtate, qualification, and condition of a Country-life, we may confidently maintain, that it far excels the City-life, and is much to be preferred before it. *Plato* affirms, that a Country-life is the Miſtreſs, and as it were the pattern of Diligence, Juſtice, and Frugality; that he could finde nothing more profitable, pleaſant or grateful, than to live in the Country remote and free from Envy, Malice, Calumny, Covetouſneſs and Ambition: which occaſioned this Grave Author to ordain ſeveral peculiar Laws relating to this Noble Art, which were brought unto and confirmed by the Emperour *Juſtinian*, &c. *Cicero* diſcourſing of the Utility of ſeveral Arts, at length concludes, that of all things neceſſary and uſeful, nothing is better, more advantagious, ſtable, pleaſant, nor more worthy a Noble and Ingenious Spirit, than *Agriculture*, &c. *Virgil* alſo had as high an eſteem thereof, and did very much extol and celebrate this *Ruſtick Art*; inſomuch that when he was almoſt loſt amongſt the pleaſant Groves, and ruminating on the Felicities the Country yielded, he brake forth into this expreſſion. 1 *De Offic.*

O Fortunatos nimium, ſua ſi bona norint,
Agricolas; quibus ipſa procul diſcordibus Armis
Fundit humi facilem victum juſtiſſima tellus.

And *Horace* in a certain *Ode* ſings thus.

Beatus ille qui procul negotiis,
Ut priſca gens mortalium,
Paterna Rura, bobus exercit ſuis,
Solutus omni fœnore, &c.

Alſo hear the Divine *Du Bartas* in his Commendation of *Husbandry*.

O thrice, thrice happy he who ſhuns the cares
Of City-troubles, and of State-affairs;
And ſerving Ceres, *Tills with his own Team,*
His own Free-land left by his Friends to him.

The

The Pleaſures and Oblectations are ſuperabundant and infinite which we daily enjoy and receive from the Verdant Fields and Meadows, from the ſweetneſs and beauty of the flowers, the ſpringing Woods, the delicate fruits, and the variety of Domeſtick and Pleaſant Animals educated even to the very hand, and from the various and harmonious Notes of the *Nymphs* of the *Woods*.

The winged Fancies of the Learned Quill,
Tell of ſtrange Wonders, ſweet Parnaſſus *Hill,*
Caſtalia's *Well, the* Heliconian *Spring,*
Star-ſpangled Vallies where the Muſes *ſing.*
Admired things another ſtory yields,
Of pleaſant Tempe *and th'* Elyſian *Fields:*
Yet theſe are nothing to the ſweet that dwells
In low-built Cottages, *and* Country-Cells, *&c.*

We may well admire at ſuch as are not highly delighted at the Proſpect of the moſt of our Country-Villages, whoſe beauty and luſtre daily encreaſe, (where their Inhabitants are Induſtrious) and appear more and more neat, adorned and enriched, and in every part yield innumerable of pleaſant and fruitful Trees. Can there be a more raviſhing and delightful object, than to behold the Towns planted with Trees in even lines before their doors, which skreen their habitations from the Winde and Sun, where they may ſit or walk under the dark ſhadows of the Woods and Groves, and where are always the gliding Streams, moſt clear and bright Rivolets, pleaſant Hills, and ſhadowie Vallies, delightful Meadows, and many other the like Oblectations?

Du Bartas. *Fair, firm, and fruitful; various, patient, ſweet,*
Sumptuouſly cloathed in a Mantle meet,
Of mingled colour, lac't about with Floods,
And all Imbroidered with freſh Blooming Buds.

That the higheſt and moſt abſolute Content any man

man enjoys or finds in any Sublunary thing, is in this Science of *Agriculture*; and the ſeveral Branches and Streams of Pleaſure and Delight proceeding or flowing therefrom, none but ſuch as are ignorant thereof will deny. Of ſuch that affirm it, we could produce infinite of Teſtimonies; alſo of many that ſo highly affected this Art and Life, that they deſerted their *Powers*, *Dignities*, *Kingdoms*, *Victories* and *Triumphs*, and wholly applied themſelves to *Agriculture*, and a *Ruſtick* Habitation; ſome whereof we ſhall here inſtance, as *Manlius Curius Dentatus*, who after he had not only Conquered the Warlike King *Pyrrhus*, but had expelled him out of all *Italy*, and had three ſeveral times Triumphed with Glory and Renown, and had very much inlarged the *Roman Empire* by his Honourable Atchievements, returned with infinite affectation, and very joyfully, to his former Exerciſes and *Ruſticities*; and there concluded the reſidue of his days with much tranquillity of minde and reſt. No leſs delight did *L. Quintus Cincinnatus* take in that Country-life, who when he was called by the *Roman Senate* to the *Dictatorſhip* (an Office of very high Dignity) was found at Plough in a rude and dirty habit or condition in his little Farm; and after he had obtained his freedom from the Office, he immediately returns to his Rural Occupations.

Alſo *Attalus*, that rich *Aſian* King, who left his Regal Dignity, and reſigned his Empire, was then ſo intent on *Agriculture*, with ſuch inceſſant care and diligence, that he formed, planted, and contrived ſeveral peculiar Gardens, by his own ſingular Ingenuity and Induſtry. We muſt not omit *Diocleſian* the *Emperour*, who left the troubleſome Empire, and affecting a Private Life, betook himſelf to the Country; and there lived a long time, and enjoyed the Experience, and reaped the Fruits of moſt pleaſing Tranquillity and happy reſt. And although that he were oftentimes invited and ſollicited by Letters and Embaſſadours from the *Senate* to return again to his Empire, yet could he never be tempted away from his Beloved Village.

We read alſo of that moſt excellent perſon *Attilius Calatinus*, who for his ſingular Vertue was called from the Plough and Harrow to be a *Dictator*; yet ſtill ſo perſiſted in his pleaſing Frugality and Parſimony, for the great love he bare to *Agriculture*, that he rather choſe to live privately in the Country, and to weary himſelf with digging and ploughing his Land, than to be a Prince of the *Romans*, and poſſeſs the higheſt place amongſt the *Senators*.

And likewiſe of *Abdolonymus*, who from a poor Gardiner (yet of Princely Race) was choſen to the Crown of *Sidon*.

Du Bartas. Noah *the Juſt, Meek* Moſes, Abraham,
(Who Father of the Faithful Race became)
Were Shepherds all, or Husbandmen at leaſt,
And in the Fields paſſed their days the beſt.
Such were not yerſt, Attalus, Philemetor,
Archelaus, Hiero, *and many a* Pretor:
Great Kings and Conſuls, who oft for Blades
And gliſt'ring Scepters, handled Hooks and Spades?
Such were not yerſt, Cincinnatus, Fabricious,
Serranus, Curius, *who un-ſelf-delicious,*
With Crowned Coulters, with Imperial hands,
With Ploughs triumphant plough'd the Roman *Lands?*

How much honour were *Piſo*, *Fabius*, *Lentulus*, and *Cicero* worthy of, who invented and brought into uſe the Commodious way of ſowing of the ſeveral Pulſes that from that time have born their names? We muſt not forget our Famous and moſt Ingenious Countryman the Lord *Verulam*, a Perſon, who though much concerned in the Publick Affairs of the Kingdom, yet ſpent much of his time and Studies in the diligent ſcrutiny of the Nature and Cauſes, and propoſed means for the advancement and propagation of this part of *Natural Philoſophy*; as his *Sylva*, and ſeveral other of his Works teſtifie.

Many other Examples of this Nature might here be inſerted: But theſe, together with the multitude of the

like

like Preſidents our preſent Age and Country affords us, as well of the Induſtrious and moſt Judicious Operations of our *Nobles* and *Gentry* in theſe *Ruſticities*, as of their Noble and pleaſant Palaces, and Rural Habitations; and the Contentments and Delights they place in them, may be ſufficient to convince all Ingenious Spirits that are not prejudiced againſt this Art, not only of the Dignity, Pleaſure, and Delight thereof, but of its Utility and Neceſſity.

Here they enjoy all things neceſſary for the ſuſtentation of life, and are freed from the perturbations, cares and troubles, that in other places diſturb the mind; and live content with their Lot, in tranquillity and moderation of ſpirit. Here is

Secura quies, & neſcia fallere Vita,
Dives opum variarum.------

This Country-life improves and exerciſes the moſt Noble and Excellent parts of our Intellects, and affords the beſt opportunities to the inſatiable humane ſpirit to contemplate and meditate on; and to penetrate into, and diſcover the obſcure and hitherto-occult Myſteries and Secrets of Nature; the fixity or mobility of the Earth, the nature of the Air, its weight and divers Mutations; the Flux and Reflux of the Sea; the nature and matter of Comets, Meteors, *&c.* the Myſtery of Vegetation; the nature of Animals, and their different Species; the diſcovery and improvements of Minerals, and to attain the higheſt perfections in Science and Art: yea, this condition capacitates a man to the ſtudy and practiſe of the moſt ſecret and myſtical things Nature affords, if adapted thereunto.

That there is no place ſo fit for ſuch ſtudy or contemplation of *Natural Philoſophy*, or any of the *Liberal Arts*, *Plato* the Prince of Philoſophers teſtifies by his deſerting *Athens*, that Splendid City, and erecting his *Academy* in a remote and *Ruſtick* place. Alſo *Petrarchus*, for the quietude and ſolitarineſs of that kinde of life, was ſo much delighted therewith, that he moſt

pleaſingly ſpent thoſe years he lived, alone in a ſecret Valley; which cauſed him ſo often to invite his Friends to come and enjoy with him the contentments of ſo happy and grateful a Country-life, as it appears by many of his Epiſtles. You will alſo finde that all ſtudious and learned men have exceedingly delighted in a ſolitary and Rural Habitation, and to have much preferred it: for beſides the ſerenity of the Air, and the pleaſing Viridity, which much quickens the *Genius*, it is moſt certain that the Spirits alſo are thereby recreated, and the Intellectual parts wonderfully acuated; as the ſame *Petrarcha* ſays:

Hic non Palatia, non Theatra, nec atria,
Sed ipſorum loco Abies, Fagus, & Pinus,
Inter herbas vireſcentes, & pulchrum montem vicinum,
Unde & Carmina deſcendunt, & Pluviæ,
Attolluntque de terra, ad ſidera noſtram mentem.

By which it is moſt apparent, that the Study of *Arts* and *Sciences*, and the exerciſe and fruition of a Country-life, are of ſo near a Reſemblance, that they may both be practiſed without impeding each the other.

This *Ruſtick* life alſo moſt certainly hath the Preheminence above the habitations in great Towns and Cities; for that it yields a perpetual Rotation of its infinite variety of Oblectations and Contents, as the various times and ſeaſons of the year with a pleaſing Face ſucceſſively preſent themſelves. Sometimes the *Spring* approaches, the moſt certain Fore-runner of the *Summer*; all Trees then exerciſing, as it were, a mutual Emulation, which ſhould be arrayed with the moſt verdant leaves, and adorned with the moſt excellent and curious bloſſoms, that they afford (beſides moſt fragrant Odours every way breathing from them) incredible delight and pleaſure to all. To theſe may you add the pleaſant Notes of the Chanting *Nymphs* of the Woods ſinging their Amorous Ditties, raviſhing our Ears with their ſweet Harmony. Then follows the *Summer*, adorned

dorned with various Flowers, the Lilly, the Roſe, the Gilliflower, and infinite other moſt curious and pleaſant; and alſo ſeveral delightful Fruits, Animals, and other neceſſaries for humane uſe. Then alſo ſucceeds the *Autumn*, or *Harveſt*, wherein we reap the fruits of our paſt labours: then doth the Earth diſcharge it ſelf of its infinite variety of its Grain and Pulſe, and the Trees of their delicacies: then alſo doth the Air begin to wax cool, to recollect and refreſh our ſpirits, before debilitated with too much heat. At length enters cold *Hyems*, which of all the reſt conduces moſt to the health of our bodies: for then our ſuperfluous humours are with cold compreſſed, or elſe concocted; and the Natural heat being the more concentrated, renews its power, and more eaſily performs digeſtion; and expelling Obnoxious Humours, as *Philoſophers* ſay, Powers united are of greater force than diſperſed; ſo then are we more firm, active, and ſtrong. The end of *Winter* gives a beginning to the ſubſequent Spring: *Annus in Angue latet*; ſo are the Rural Pleaſures and Oblectations renewed *ad infinitum.*

The *Heathens* of old had alſo a very high eſteem of *Agriculture*, as appears by their ſeveral *Gods* and *Goddeſſes* whom they judged had a Tutelar care over thoſe Fruits of the Earth, and other things under their Tuition; as *Bacchus*, *Ceres*, *Diana*, *Saturn*, *Flora*, *Pales*, and ſeveral others. But leaving them, we finde many Learned men, of Profound parts, and moſt excellent Ingenuity, to have taken delight, and to have been very ſtudious of this *Art*; as *Cicero*, who ſo highly affected and eſteemed theſe *Ruſticities*, that (amongſt ſeveral other *Rural* Habitations, wherein he took much delight) he was ſo well pleaſed with the pleaſant Scituation of the *Tuſculan* Fields or Country, as there to inſtitute as it were another *Academy*, and compoſe thoſe Philoſophical Queſtions, which from the place he named *Tuſculan*. *Cato* the *Roman Cenſor*, and Excellent *Moraliſt*, was wont to ſay, that he placed his whole Recreation and the Univerſal Tranquillity of his minde in the

exerciſe

exerciſe of *Rural Affairs*: therefore with infinite of pleaſure and affectation did he inhabit in the Village *Sabine*, poſitively affirming, that a better and more pleaſant life was not to be found. *Seneca* alſo was of the ſame Opinion, that he could tarry in no place more willingly than in his own Village; into which, with a very great Art, he brought an *Aquaduct* to water his Gardens. What ſhall we ſay of *Varro*, *Palladius*, and *Columella*, who publiſhed ſo many uſeful and profitable Precepts of *Agriculture*, and ſo induſtriouſly exerciſed and delighted themſelves in a *Ruſtick* life? We might produce many more inſtances of moſt Honourable, Learned, and Worthy Perſons, who rather elected and preferred to ſpend their remaining days in the Country, than in the moſt Pompous Palaces and Cities, but that we judge it needleſs. Such that deſire to hear more, we refer them to *Pliny*, and other Authors more Copious in Hiſtorical Relations.

It is for no other reaſon that *Gardens*, *Orchards*, *Partirres*, *Avenues*, *&c.* are in ſuch requeſt in Cities and Towns, but that they repreſent unto us Epitomized, the *Form* and *Idea* of the more ample and ſpacious pleaſant *Fields*, *Groves*, and other *Ruſtick* objects of pleaſure. Formerly *Gardens* were not in Cities and Towns, but in Villages without, as *Pliny* witneſſeth, until *Epicurus* (the Doctor and Maſter of Pleaſure and Voluptuouſneſs) firſt planted them in *Athens*; which was afterwards imitated and brought into uſe by ſuch who loved their Pleaſures. *Gardens*, where ever planted, were always in eſteem; as the Famous *Gardens* of *Adonis* and *Alcinous*, and thoſe *Horti Penſiles* of *Semiramis* Queen of *Babylon*, or *Cyrus* King of *Aſſyria*, elevated ſo high from the Earth on *Tarraces* and other *Edifices*, that they were numerated amongſt the moſt ſtupendious and wonderful works that were in the World. Alſo that Renowned and Fictitious *Garden* of the *Heſperides*, Hieroglyphically and Philoſophically repreſenting unto us the Summary of Eternal Atchievements or Enjoyments. The *Romans* alſo

alſo made great ſtore of *Gardens*, and placed great pleaſure in them. We muſt not forget the ſingular care and induſtry of the *Egyptians* in Tilling their *Gardens*; wherein, by reaſon of the tempetature of the Air, the goodneſs of the Earth, and their exquiſite Induſtry, flouriſh and grow throughout the year, the green Herbs, and infinite variety of pleaſant Flowers. How many rare and excellent *Gardens*, and places allotted and deſigned for Pleaſure, are in every part of this Kingdom, and in our Neighbouring Countries; but more eſpecially in Renowned *Italy*, the Garden it ſelf of the World? The great ſtudy, care, ingenuity, coſt and induſtry beſtowed and imployed about them, are Arguments ſufficient to convince the greateſt Antagoniſt of the infinite contentment and delight they had and enjoyed in *Agriculture*, and thoſe kinde of Rural exerciſes: the commendations whereof, the great advantages, oblectations, and its univerſal uſes and pleaſures are ſo many, and too tedious here to enumerate, that it requires an eloquent Pen, and an expert hand to diſcover its worth, and not to be crowded into ſo narrow a confine as a *Preface*. More you may read in ſeveral Authors of its praiſe, practiſe and worth; as *Horace* in ſeveral of his Poems hath written in the praiſe of *Agriculture*, and a *Country-life*. In *Tibullus* alſo you have one of his Elegies full of praiſes and delights of a *Country life*. So alſo *Angelus Politianus* his *Sylva Ruſtica*, and *Pontanus* his ſecond Book *De Amore Conjugali*: Alſo *Cicero* in his Book *De Senectute*, writes in praiſe and commendation of the Country, and of *Agriculture*; where he ſays in one place, *Venio nunc ad voluptates Agricolarum, quibus ego incredibiliter delector*, &c. *Du Bartas* alſo in his Divine Poems, omits not the praiſe of this, as moſt praiſe-worthy. But *Virgil* hath more fully and amply ſet forth its praiſes and commendations in his *Georgicks*, where he treats particularly of that Subject; and doth not only recount the pleaſures and profits that proceed from it, but very Learnedly and Ingeniouſly alſo treats of the *Art* it ſelf, and gives many

Precepts

Precepts which are neceſſary to be obſerved in the exerciſe of *Agriculture*, which renders it more delightſome and beneficial. *Heſiod* alſo, one of the prime Poets amongſt the Ancients, hath written an excellent exciting and neceſſary Poem treating of this *Art*. Several others there are that have copiouſly and learnedly treated on this *Subject*.

Alſo a moſt evident demonſtration and ſure Argument of the Utility, Pleaſure and Excellency of this Branch of Natural Philoſophy, is the principal care the Royal and Moſt Illuſtrious Society take for the advancement thereof, and for the diſcovery of its choiceſt and rareſt *Secrets*, and the moſt facile and advantagious means to improve the ſeveral Experiments and Practiſes relating to that *Subject*; as the ever-honoured Mr. *Evelin*, a moſt Worthy Member of that *Society*, in particular hath done on one of the moſt principal parts of *Agriculture*; *viz.* the planting of Trees both for Timber, Fruits, and other neceſſary uſes, and of making that Incomparable Liquor, Cider.

But nothing could more conduce to the propagating, incouraging, and improving of this moſt neceſſary *Art*, and of all other Ingenious and Mechanick *Arts*, *Inventions*, and *Experiments*, than the Conſtitution of Subordinate Societies (after a Provincial manner) in ſeveral places of the Kingdom, whoſe principal care and Office might be to collect all ſuch Obſervations, Experiments, and Improvements they finde within their Province, relating to this or any other Art within their Inquiry; which particular *Societies* might annually impart ſuch Collections, Obſervations, Experiments, and Improvements that they have obtained, to the *Grand Society*; and from them alſo might Copies or Duplicates of the whole Collection be Annually tranſmitted to each Subordinate Society, that any perſon may have a place near unto him for the diſcovery of his Obſervations, Experiments, Inventions, or Improvements; and that diligent, induſtrious and ingenious

nious persons may have recourse thereunto, for the inquiry and search into the several Inventions, Discoveries, and Improvements of others: by which means every person may have an opportunity to publish or discover his Observations, Experiments, &c. which otherwise have been, and will be, for the most part, with their Authors buried in Oblivion; and every one may also have the like opportunity or advantage to search into, or enquire after the several Ways, Methods, Inventions, &c. used or discovered in any other place of *England*, of such things relating to this Society; which of necessity must abundantly improve *Science* and *Art*, and advance *Agriculture* and the *Manufactures*, two of the Principal Supports of this Nation, *Wealth* and *Honour*.

That the particular proceedings (already made known) of that most *Illustrious Society*, and the more Universal much desired and expected from them, (next unto the Publick Peace and Tranquillity of the Nation) are esteemed the only ways and means to promote Industry and Ingenuity, to imploy our numerous People, to cultivate our waste Lands, to convert our barren Fields into fruitful Gardens and Orchards, to make the Poor Rich, and the Rich Honourable, every man is willing to assist in so Universal a work (unless those who thrive by others ruines.) We finde many have acted their parts, and discovered to the World what they apprehended or had the experience of; which though much short of what may be done, yet have they not lost their Aim. Many by their Rules, Precepts, Observations and Experiments, have highly advanced this Noble Science of *Agriculture*. But seeing some of those Treatises are relating to particular Countries or places, or to some branch only or part of this our *Subject*, and those also difficult to be obtained, and many of them filled with old obsolete and impertinent directions and things, and too voluminous for our Laborious Husbandman, whom they principally concern, I thought it no time ill spent in such times

and hours, as other neceſſary Affairs detain me not, to collect ſuch uſeful Obſervations, Precepts, Experiments and Diſcoveries, which I finde diſpers'd in the ſeveral Authors treating of this *Subject*, and to reduce them into the following *Method*; omitting ſuch things as have been found to be uſeleſs, falſe, or meerly putative or conjectural, or relating to other Climates; and adding alſo ſuch Diſcoveries, Obſervations and Experiments as I have obtained from others, and my ſelf diſcovered, and never before publiſhed by any. You have here Epitomized the Subſtance and Marrow of all or moſt of the known *Authors* treating of this *Subject*, or any part thereof; and alſo ſuch new and neceſſary Obſervations and Experiments as are for the benefit and improvement of our Country-habitations: which I hope may gratifie ſuch Readers as deſire a work of this Nature, until our *Philoſophers* and *Heroes* of *Science* and *Art*, handle the *Plough* and *Spade*, and undertake the more Plenary Diſcovery and Deſcription of theſe Ruſtick Operations; which indeed require not only an experienced Hand, but a judicious and ingenious Pen; until when, I hope this indigeſted Piece may finde a place in our *Rural Libraries*; and then I ſhall willingly be the firſt that ſhall commit this to the Flames, to give way for a better; which that we may ſuddenly obtain, is my earneſt deſire.

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CHAP.

CHAP. I.

Of Husbandry and Improvements in general; plainly discovering the Nature, Reasons, and Causes of Improvements; and the Growth of Vegetables, &c.

What Agriculture is.

Griculture hath been (not undeservedly) esteemed a Science, that principally teacheth us the Nature, and divers Properties and Qualities, as well of the several Soils, Earths and Places, as of the several Productions or Creatures, whether Vegetable, Animal, or Mineral that either naturally proceed, or are artificially produced from, or else maintained by the Earth. *Agricultura est Scientia docens quæ sunt in unoquog; Agro serenda & facienda, quæ terra maximos perpetuo proventus ferat*, saith *Varro*.

Of the Subject wherein the Husband man bestows his labor.

The Judicious and Understanding *Husbandman* must first consider the Subject whereon to spend his Time, Cost, and Labor, *viz.* the Earth, or Ground; which we usually term either Meadow, Arable, Pasture, Woodland, Orchard, or Garden-ground: then, whether it be more Commmodious or Profitable for Meadow, for Pasture, or for Woods, which in most places are naturally produced, to the great advantage of the *Husbandman*; or with what particular Species of Grain, Pulse, Trees, Fruits, or other Vegetables, it is best to Plant or Sowe the same, to his greatest benefit; And with what Beasts, Fowl, or other Animals, to Stock his Farm or other Lands. Also he is to consider the best and most commodious way of Tilling, Improving, Propagating, Planting, and Manuring all such Meadows, Arable and Pasture Pasture-Lands, Woods, Orchards, and Gardens; and the Reasons and Causes of such Improvements. All which we shall endeavor to discover, to the satisfaction and content of the diligent and laborious Husbandman.

But before we enter upon the particular Ways and Methods of Agriculture treated of in this ensuing Work, we shall endeavor to unvail the secret Mysteries (as they are commonly esteemed) of the Productions and Increase of Vegetables, after a plain and familiar Method, not exceeding the Capacity of our Husbandmen, whom this Treatise doth principally concern; by the true

knowledge whereof, a gate is opened to Propagate, Maturate, or Advance the Growth or Worth of any Tree, Plant, Grain, Fruit or Herb, to the higheſt pitch *Nature* admits of.

Of the univerſal Spirit or Mercury.

De Fermentatione.

This Globe of Earth that affords unto us the ſubſtance, not only of our ſelves, but of all other *Creatures Sublunary*, is impregnated with a *Spirit* moſt *ſubtile* and *Ethereal*, as it were, *divinioris Auræ particula* (as the Learned *Willis* terms it) which the *Original* or *Father* of *Nature* hath placed in this World, as the Inſtrument of Life and Motion of every thing. This Spirit is that which inceſſantly adminiſters unto every Animal its Generation, Life, Growth, and Motion; to every Vegetable its Original and Vegetation: It is the *Vehicle* that carrieth with it the *Sulphureous* and *Saline* parts, whereof the Matter, Subſtance, or Body of all Vegetables and Animals are formed or compoſed. It is the Operator or Workman, that tranſmutes by its active heat the *Sulphureous* and *Saline* parts of the Earth or Water into thoſe varieties of Objects we daily behold or enjoy, according to the different Seed or Matrix wherein it operates: It continually perſpires through the pores of the Earth, carrying with it the *Sulphureous* and *Saline* parts, the only treaſure the Huſband-man ſeeks for, as hath been by ſome Ingenious Artiſts mechanically proved, by receiving the ſame between the *Vernal* and *Autumnal Equinoxes* in an Alembick-head, where it hath condenſed, and copiouſly diſtilled into the Receiver, at that ſeaſon of the year; the Earth then more liberally affording it, than in the Winter-ſeaſon: which Spiritual Liquor ſo received, is not a Treaſure to be ſleighted or neglected, carrying with it the only Matter of Vegetables, as the ſame *Artiſts* affirmed, that having placed the ſame under a *Melon-Glaſs* near ſome *Vegetable*, it was *thereby* wholly attracted externally, and converted into that *Vegetable*; they concluded alſo the ſame to be that *Materia Prima quæ abſq; omni ſumptu, labore & moleſtia reperta eſt, & quam in aëre capere te oportet antequam ad terram perveniat, &c.* This Liquor undoubtedly would be of ſingular Vertue and Effect in advancing and maturating the Growth of the more excellent Flowers or Curioſities, being irrigated therewith. It is eaſily obtained, and that in great Quantities, by ſuch that think not a little time and labor loſt, to ſcrutine into the Myſteries of Nature. But whether we obtain it ſingly, or ſimply, or not, this we know, that it is to be received by placing the more natural *Receptacles*, the Seeds and Plants in the Earth, which gives it us tranſmuted into ſuch Forms and Subſtances as are moſt deſired and neceſſary.

Of the Univerſal Sulphur.

De Fermentatione.

Although the Spirit or *Mercury* be that active and moving part, and that principally appears in the Generation or Conception of any Vegetable or Animal, and is alſo the firſt that flies in the ſeparation or diſſolution of Bodies, yet is it imbecile and defective without that moſt Excellent, Rich, and *Sulphureous Principle*, which (according to the deſcription of the Learned *Willis*) is of a little thicker conſiſtence than the *Spirit*, and next unto it the moſt active; for when any mixture or compound is ſeparated, the Spirits firſt fly, then follow after the *Sulphureous Particles*. The temperature

perature of every thing, ſo far as to the Heat, Conſiſtence, and curious Texture thereof, doth principally depend on *Sulphur*; from hence every Plant, Fruit and Flower receives thoſe infinite varieties of Forms, Colours, Guſts, Odours, Signatures, and Vertues; it is that which is the proper *Medium* to unite the more Volatile *Mercury* or *Spirit* to the more fixed *Salt*. *Spiritus Mediante Anima cum corpore conjungitur & ligatur, & fit unum cum eis*, ſay the *Philoſophers*. This *Sulphur*, or oyly part, is eaſily ſeparated and diſtinguiſh'd in *Vegetables* by the more curious: it ariſeth out of the earth with the aforeſaid *Mercury* or *Aqueous Spirit*, though not at the firſt diſcernable, yet in every Plant more and more maturated and augmented by the Suns influence, as the *Seed* or *Matrix* is more or leſs inclined to this Principle: This is alſo that which gives to our hot and ſtinking Dungs, Soils, or Mantures, the Oleaginous pinguidity and Fertility, and which begets that fiery heat which is in Vegetables, as Hay, Corn, *&c.* laid on heaps not throughly dry.

Of the Univerſal Salt. Willis de fermentatione.

Not only the Duration of *Individuals*, but alſo the Propagation of the Species dependeth much on the *Principle of Salt*: for the Growth of Minerals, the Fertility of Land, the Vegetation or Growth of Plants, and chiefly the fruitful Fœtation and Progeny of Animals, have their Original from their *Saline* Seed. This *Salt* obſcurely paſſeth with the *Mercurial Spirit* and the *Sulphur*, and is aſſociated therewith; where ever that paſſes, and where it finds a convenient *Receptable*, *Seed*, or *Matrix*, it is more fixed than either the *Sulphur* or *Spirit*. The *Salt* is that which gives to every Creature a Subſtance or Body, without which neither the *Spirit* nor *Sulphur* could be reduced or coagulated into any Form; It is in every thing: *Sal autem reperitur in rebus omnibus*. It is volatile, when carried in the wings of the *Spirit* and *Sulphur*, by the natural Fire or Motion: But afterwards it is more fixed, when ſeparated from the *Spirit*, or *Mercury*, and *Sulphur* by artificial Fire, as appears in the aſhes or *Caput Mortuum* of all *Vegetables*, *Animals*, or *Minerals* diſtilled or burnt; much alſo of the *Sulphureous* or *Mercurial* parts are coagulated by, or tranſmuted into the *Saline* by natural or artificial Heat or Warmth, as is evident in the *Sea*, the nearer it is to the *Equinoctial* Line, and the more it receives of the Perpendicular or direct Beams of the Sun, the greater quantity of *Salt* it contains, not only by the exhalation of the *Aqueous* or *Phlegmatick* parts, but the Maturation, Tranſmutation, or Fixation of the more Volatile, *Spiritual*, and *Sulphureous* parts, into the more *Saline* or fixed: For in thoſe hotter *Climates* the Land it ſelf alſo is more Fertile through the abounding quantity of this Vegetating *Salt*, as appears by the great plenty of *Nitre*, or *Sal terræ* found in the hotter Climates, lying on the Surface of the Earth in the morning like a hoary Froſt: when the Regions nearer the *Poles*, having not thoſe natural advantages of the *Sun-beams* in ſo high a degree, are not ſo Fertile, nor abound ſo much with Salt, the moſt principal cauſe of Fertility.

Of the true matter of Vegetables.

But we will leave theſe *Philoſophical Principles* as they are ſimply and apart very neceſſary to be known by thoſe that Operate in the more

more-*Secret*, *Myſtical*, and *Mechanick* Indagations of Nature, and diſcourſe only of that Univerſal *Spirit* or *Vapor*, which daily and every moment perſpires and proceeds out of every part of the Earth, and is in every thing, containing in it ſelf the *Spirit* or *Mercury*, the *Sulphur* and the *Salt* in one body united: and without Art indiviſible, yet ſome one Part or Principle abounding more or leſs in every thing; as the Water containeth more of the *Spiritual* or *Aqueous* part; ſeveral *Fruits*, *Plants*, *Flowers*, and *Soils*, more of the *Sulphureous*; and *Barks* of *Trees*, *Blood* of *Animals*, and ſeveral *Minerals*, more of the *Saline*. And whereſoever theſe *Principles* are moſt equally tempered or mixed, there is moſt of Fertility, as is evident in the ſeveral Natures, Tempers and Qualities of Places, for the Production or Propagation of *Vegetables*; and whereſoever any or either of theſe Principles do over-much abound, Vegetables are not produced; as Waters, or any other Liquors, or Spirits, are not Fertile in themſelves as to Vegetation, unleſs they are either conjoyned with ſome other Subſtance or Matter, or the more Phlegmatick parts evaporated, and the remaining part maturated by the Sun or Air into an augmentation of the other *Principles*, then is it capable of yielding naturally ſome ſort of Vegetables: For although ſeveral Plants ſet in Water only, do emit fibrous roots, and flouriſh therein for a time; yet is it meerly an attraction of the moſt *Saline* and *Sulphureous* parts or *Principles* to its own relief, as is evident by its better thriving, if the Water be often changed: At beſt, this nouriſhment is but weak, having ſo little of the *Sulphur* and *Salt*; as the *Withy*, *Poplar*, and other *Aquatick* Plants demonſtrate. Therefore out of any ſort of Waters only, it is in vain to attempt any material or effectual increaſe of Vegetables, other than that are naturally *Aquatick*, becauſe they contain a ſuperabundant Spirit or Moiſture. Therefore vain is the new received Opinion that Trees and other Vegetables, and alſo other Minerals, proceed from Water only. But our *Spiritus Mundi*, or *Materia propinqua Vegetabilium*, although it appear in a Liquid form, yet it contains actually an equal proportion of the three *Principles*: And the more any Subſtance or Matter is impregnated, or irrigated therewith, the more prone or apt it is to Vegetation; as Rain-water being animated with it by the continual Exhalations or Fumes aſcending from the Earth, and by it coagulated and detained, is more prone to Vegetation than any other Waters, as you may perceive by Plants watered therewith, and by its ſudden Generation of Animals and Vegetables in the Spring-time, then the Earth more copiouſly breathing forth that *Spiritus Mundi*, which returned again, doth by the vivifying heat of the Sun, eaſily tranſcend into another Species. How ſoon will Horſe-hairs receive life, lying in Rain-water but a few days in the heat of the Sun in the Spring-time! whereof I have ſeen many in the High-ways after Rain in the Month of *May*, very nimble and quick, that had not yet loſt their ſhape of a Horſe-hair. This is worthy our further enquiry, to what Period this may be advanced: it may alſo ſerve as an *Index* to point at ſeveral other Excellent Diſcoveries.

where water or Spirits abound.

Neither

Neither is the more *Sulphureous* part or *Principle* of it ſelf capable of yielding *Vegetables*, being of too hot and pinguid a Nature, as the Dung of Animals (and eſpecially of Volatiles that eject no Urine, whereby the more fiery and *Sulphureous* part of the others is diluted) containing much of that pinguidity, produce no Vegetables of it ſelf, unleſs commixed or allayed with ſome other Matter abounding with the other *Principles*, or that it looſe its too fiery or deſtructive Nature, by being expoſed to the Sun or Air, untill it be evaporated, then will it emit ſeveral Vegetables: Of the like Nature alſo are the fleſh and bones of Animals, yielding a very rich Compoſt, though of themſelves (through over-much heat and pinguidity) ſterile. *Where Fumes or Sulphur abounds.*

The *Saline*, or more fixed *Principle*, which is eſteemed by moſt Authors the only thing conducing to Fertility, yet is of its ſelf, or in an over-bounding quantity, the moſt barren and unfruitful. It is preſcribed as a ſure way to deſtroy Weeds (*Vegetables*) by watering the place with Brine or Salt-water; yet what more fruitful, being moderately commixed with other Materials of another nature, than Salt? But obſerve, that Salts extracted out of the Earth, or from Vegetables or Animals, are much more Fertile than thoſe of the Sea, containing in them more of the Vegetative Power or *Principles*, and are therefore much to be preferred. *Where Salt abounds.*

Glauber makes it the higheſt improvement for the Land, and for Trees alſo, affirming that by it you may enrich the moſt barren Sands, beyond what can be performed by any other Soils or Manures, in caſe it be deprived of its Corroſive Qualities; for then will it naturally attract the other *Principles*, continually breathing out of the Earth, and in the Air, and immediately qualifie it ſelf for Vegetation; as I obſerved in a parcel of Field-Land of about three Acres *denſhired* or *burn-beaten* in a very hot and dry Spring, of it ſelf naturally barren, and after the burning and ſpreading the aſhes, wherein was the Fertile Salt deprived of its Corroſive ſterile quality, the Land was plowed very ſhallow, and Barly ſown therein about the beginning of *May*, in the very aſhes as it were (no Rain falling from the very beginning of cutting the Turf) yet in thirty and ſix hours was the Barley ſhot forth, and the Ground coloured green therewith; this Salt attracting and condenſing the ever-breathing *Spirit*. The like you may obſerve in Walls and Buildings, where ſeveral ſorts of Vegetables, yea, trees of a great bigneſs will thrive and proſper remote from the Earth, and without any other nouriſhment than what that Fertile Salt attracts and condenſes, as before; which it could not have done, had it not been purged of its Corroſive and Sterile Nature by Fire when it was made into Lime: For all *Chymiſts* know, that no Salts more eaſily diſſolve *per deliquum*, than thoſe that are moſt calcined. Continuatio Miraculi Mundi.

The Salt alſo of the Sea is not without its Fertile Nature, being ordered with Judgment and Diſcretion, as we ſee evidently, that the Salt Marſhes (out of which the Sea is drain'd) excel in Fertility: and many places being irrigated with the Sea-Water, yield a notable increaſe; Corn alſo therewith imbibed, hath been much advanced

advanced, as appeared in the Preſident of the Country-man that caſually let his Seed-Corn fall into the Salt-Water. And in the Iſle of *Wight* it is obſerved, that Corn flouriſheth on the very Rocks that are bedewed with the Salt-water by the Blaſts of the Southern Winds. The ſhells of fiſh, being as it were only Salt coagulated, have proved an excellent Manure for barren Lands after they have lain a competent time to diſſolve.

Equal commixture of Principles.

From what hath been before obſerved, we may conclude that the higheſt Fertility and Improvements are to be advanced and made from the moſt equal Commixture of the aforeſaid ſeveral *Principles*, or of ſuch Waters, Soils, Dungs, Salts, Manures, or Compoſts that more or leſs abound with either of them, having regard unto the nature of ſuch *Vegetable*, whoſe propagation or advancement you intend: Some delighting in a more Hot or Cold, Moiſt or Dry, Fat or Barren, than others. And next unto that, from due Preſervation, Reception, and right diſpoſing and ordering of that *Spiritus Mundi*, every where found, and to be attained without Coſt, and as well by the poor as rich.

It continually breaths from the Earth, as we noted before, and is diffuſed in the Air, and loſt unleſs we place convenient Receptacles to receive it, as by Planting of Trees, and ſowing of Pulſes, Grain, or Seed. Out of what think you ſhould theſe things be formed or made? Out of Rain-water, is the common Anſwer or Opinion. But we experimentally finde, that this *Univerſal Subject* gives to every Plant its Eſſence or Subſtance, although aſſiſted by Rain or Water both in its nouriſhment and condenſation.

We ſee how great a Tree is raiſed out of a ſmall Plat of Ground, by its ſending forth of its Roots to receive its nouriſhment, penetrating into the ſmalleſt Crannies and Joynts between the Stones and Rocks, where it finds the greateſt plenty of its proper food. We conſtantly perceive and finde, that Vegetables having once emitted their fibrous Roots, vegetate and increaſe only from the aſſiſtance of this our *Univerſal Subject*, when the Earth wherein it ſtands is of it ſelf dry, and not capable to yield that conſtant ſupply of Moiſture the Plant daily requires. Although we muſt confeſs that Rain or other Water accelerates its Growth, having in it a Portion of that *Spiritus Mundi*, & alſo better qualifies the Earth for its perſpiration.

That this *Subject* is the very Eſſence of Vegetables, and that from it they receive their Subſtance, and not from water only, is evident, in ſuch places where Vegetables are not permitted to grow, and where it cannot vapor away, nor is exhaled by the Sun nor Air; as Underbuildings, Barns, Stables, Pigeon-houſes, *&c.* where it condenſes into *Nitre*, or *Salt-Petre*, the only fruitful Salt (though improperly ſo called) containing ſo equal and proportionable a quantity of the *Principles* of *Nature*, wholly Volatile, only condenſed in defect of a due recipient; not generated, as ſome fondly conceive, from any caſual Moiſture, as Urine in Stables, *&c.* though augmented thereby, but meerly from the *Spiritus Mundi*. Lands reſting from the Plough or Spade, are much enriched only by the encreaſe of this *Subject*, and ordinary way of Improvement.

Lands

Lands defended from the violent heat of the Sun, and from the ſweeping, cleanſing, and exſiccating Air or Winds, grow more Fertile, not ſo much from the warmth it receives, as from the preſervation of that Fertile *Subject* from being waſted; as we evidently ſee it to be in all open Champion Lands, when part of the very ſame Species of Land being incloſed with tall and defenſive Hedges, or Planted with Woods, are much more Fertile than the other: yea, we plainly perceive, that under the Covert of a Buſh, Bough, or ſuch like, any Vegetable will thrive and proſper better than on the naked Plain. Where is there more barren, dry, and hungry Land, than on the Plains and Waſte Lands? and yet but on the other ſide of the hedges Fertile, either by Incloſure, or Planted with Woods: an evident and ſufficient demonſtration of the high Improvements that may be made by Incloſure only. Alſo Land hath been found to be extraordinary Fertile under Stones, Logs, of Wood, *&c.* only by the condenſation and preſervation of that *Univerſal Subject*, as appears by the flouriſhing Corn in the moſt ſtony Grounds, where it hath been obſerved that the Stones taken away, Corn hath not proved ſo well; and Trees having Stones laid on the Ground about the Roots of them, have proſpered wonderfully from the ſame cauſe: As the Learned *Virgil* hinted on the ſame occaſion.

——— *Jamque reperti*
Qui Saxo ſuper, atq; ingentia pondere teſtæ
Urgerent. ———

In the watering of Meadows, you may obſerve that the ſuperficial gliding watering thereof doth infinitely advance its fertility, and accelerates its growth or vegetation; not ſo much from the fruitfulneſs of the water, (although that be a very great help, and ſome waters abound very much with that *Univerſal Subject*) but by its condenſation and preſervation of that *Subject*; as appears by the warmth and early ſpringing of ſuch Meadows, where the water thinly and ſuperficially moves over it; where on the contrary, water ſtanding and ſubmerging ſuch Meadows, and lying and ſoaking long under the ſuperficies of the Earth, impedes the motion of that *Subject*, and makes the ground more ſterile, and backward in its growth or ſpringing. That this *Spiritus Mundi* hath in it a ſenſible heat as well as fertility, we may perceive by Springs in great Froſts, when the Pores of the Earth are ſhut; the Body from whence the Springs flow is warm; on the contrary, when the Pores are open, and this *Spirit* waſted, and transformed into Vegetables, Animals, *&c.* and exhauſted by the heat of the *Sun*, then is the Body internally cold, as we ſenſibly perceive by the waters in Wells in Summer-time.

This *Spiritus Mundi* whereof we treat, is that which in ſome places perſpires more freely than in other, and cauſes that different verdant colour of the Graſs in certain rings or circles, where the Country-people fancie the *Fairies* dance.

The more the Aqueous humour or part is concocted or exhauſted by the heat of the *Sun* in the Summer-time, the thicker and more

more viſcous is this *ſubject*; as appears by its condenſation in the *Air* into *Mildews*, which after a more glutinous manner than other Rains or Dews, is by the cool Air condenſed into a fat and fruitful matter, part thereof reſting on the cloſe and glazie leaves of the Oak, and ſuch-like Trees, is collected, and with very little Art transformed by the induſtrious Bee into that noble ſubſtance *Honey*; other part thereof falls on the young *Ears* of *Wheat*, and the Buds of ſpringing *Hops*, where ſuffering a further degree of congelation, impedes their growth, unleſs a timely ſhower waſh it off: It alſo by its heat tinges the ſtraw of corn and the leaves of ſome Trees in ſpots. At that ſeaſon of the year alſo it uſually coagulates in ſome places into *Muſhrooms*, which are meerly formed and made up of this ſubject undigeſted, and perſpire forth in ſuch places in great plenty, ſo that I have ſeen a *Muſhroom* near an Ell in compaſs of leſs than two days growth: the Owner in whoſe Garden it grew, affirmed it to be of one night only. You may alſo perceive it in a clear and cool morning condenſed into ſmall lines like unto Spiders-webs, near the ſurface of the earth, eſpecially on the lower and richer Lands.

This is that *Viſcous* Vapour that being concocted and digeſted long in the Air by the heat of the *Sun*, or otherwiſe, is condenſed at length into that *Sulpherous* and *Saline* Matter; and which, by its combat in the Air, occaſions thoſe Igneal Flames, and Claps of Thunder, which more frequently happen at ſuch ſeaſons of the year, and in ſuch Climates when and where this more concocted *Vapour* abounds; and leſs in the colder Climates and Seaſons, where it is more aqueous.

This is that inexhauſtible Treaſure the Country-man is to preſerve, much more than the Soils and Dungs, and ſuch-like matters waſhed away with waters into the Sea, which are inconſiderable in compariſon of this: for although Land be never ſo much impoveriſhed through over-tilling thereof, yet duly order'd and defended, by this only Subject may it be recruited and fertilized, as is evident in the pooreſt Land where Trees are grown, after the removal of them, the Land is much inriched by their ſhelter. Alſo the return of the Soil or Dung that is made of the Product of any Land either by Paſturing or Tilling the ſame, is a principal part of a good Huſband; and not to feed Cattle, cut Hay, and ſowe corn on ſome Lands, and ſpend their Soil and Manure on other; which is a grand neglect, and a main cauſe of ſo much barren and unfruitful Land in *England*.

Another thing worthy our conſideration concerning this *Univerſal Subject*, is the abating or removing the Impediments of its Fertility, which do as it were ſuffocate or conceal that fertile or vegetating quality that is in many things; As in Chalk, and ſeveral other Stones, Minerals, and Earths, the Acid or ſterile Juice doth prevent that Fertility, which otherwiſe might be raiſed from it. Therefore do our Huſband-men uſually burn Stones into Lime, which gradually evaporateth the Acid quality, and coagulateth and fixeth the more Saline and Fertile, which cauſeth it to yield

ſo

ſo plentiful a nouriſhment unto Vegetables more than before it was burnt into Lime.

For the ſame cauſe is the Superficies or Turf of the Earth burnt in many places, which Country-men uſually call *denſhiring* or *burn-beating*; only they ſuppoſe that the Aſhes of the Vegetable contained in the Turf occaſions the Fertility: But although that doth yield a part, yet it is the heat of the fire evaporating, and conſuming the Acidity of the Earth, which makes the Earth it ſelf ſo prepared, to be the more fertile; As you may obſerve by the very places where thoſe hills of fire were made, that although you take the Aſhes wholly away, yet the Earth under thoſe hills being ſo calcined, yields a greater nouriſhment to ſuch Vegetables growing thereon, than on any other part of the ground where the Aſhes themſelves are ſpread.

For the ſame reaſon are the Summer-Fallowings advantageous to the Huſbandman, not only for the deſtroying of the weeds, but for the evaporation of the Acid barren Juyce, and digeſting and fixing the fertile; by which way of Calcination may ſeveral *Stones*, *Minerals*, and *Earths* be made fertile, which unprepared are not ſo: this may alſo prove of great uſe for the advancement of the growth of many excellent Plants and Flowers, as I have been credibly informed hath been ſecretly practiſed to that purpoſe.

The laſt and none of the leaſt conſiderable means for the re-reviving and improving this *Subject*, is not only the planting, ſowing, and propagating of *Vegetables* in every place, but to plant, ſowe, or propagate ſuch that delight in the *Soyl* or *Place* under your improvement: be the nature of the *Soyl* or *Earth* what it will, there is ſome Plant or other delights in it: from the higheſt, cold, hot, dry, or barren hill, to the loweſt valley, although in the water it ſelf, you will finde either Trees, Pulſes, Graſſes, Grains, or ſome other *Vegetable* may be found that will thrive in it. *Hic ſegetes, illic veniunt felicius uvæ; Arborei fœtus alibi; atque myriſſa vireſcunt gramina*, &c. *Virgil.* The want of the right underſtanding hereof hath been one of the greateſt checks to our Engliſh Improvements; there being ſo great variety of Land in this Kingdom, yea almoſt in every Pariſh doth the Land vary, that when we have had any new way or Method of Improvement urged, by ſowing or propagating any new ſort of Grain, Pulſe, or Hay, or otherwiſe, ſeveral have attempted it, few only perhaps have hit the mark, or applied it to the right Soil; the reſt having loſt their labour and coſt meerly through their own ignorance of the true nature and way of ordering of what they undertake, have caſt a ſcandal on the thing it ſelf, to the great diſcouragemement of others, who otherwiſe might have reaped great advantage by it.

Having thus given you a ſhort Deſcription of the Growth of *Vegetables*, and of that *Univerſal Subject*, or *Spiritus Mundi*, out of which they are formed, and of the general Cauſes of *Improvements*, I will now deſcend to the more particular and practicable Application thereof; And firſt

CHAP. II.

Of the great Benefits and Advantages of Enclosing Lands.

ENcloſing of Lands, and dividing the ſame into ſeveral Fields, Paſtures, *&c.* is, and hath been ever eſteemed a moſt principal way of Improvement, it aſcertaineth every man his juſt and due Propriety and Intereſt, and preventeth ſuch infinite of Treſpaſſes and injuries, that Lands in common are ſubject unto; occaſioning ſo much of Law, Strife, and Contention: It capacitates all ſorts of Land whatſoever for ſome of the Improvements mentioned in the ſubſequent Diſcourſe, ſo that a good huſband may plant *Timber*, *Fruit*, or other *Trees* in his Hedge-rows, or any other part of his Lands, or may convert the ſame to *Meadows*, *Paſture*, *Arable*, or *Gardens*, &c. And ſowe or plant the ſame with any ſorts or ſpecies, of Grain, Pulſe, or other Tillage whatſoever, without the check or controul of his unthrifty or envious Neighbours.

Enclosure an Improvement.

It is alſo of its ſelf a very conſiderable Improvement: And take it, as it is the moſt general, ſo it is one of the higheſt Improvements in *England*, and it ſeems to have born an equal honor and prehemmence, above Lands in Common in other Countreys; and to contend for its Antiquity with the Plough it ſelf; elſe why ſhould *Virgil* ſay?

Ante Jovem nulli ſubigebant arva Colani,
Nec ſignare quidem, aut partire limite Campum,
Fas erat, ——

Encloſure with a good tall Hedge-row, preſerves the Land warm, and defends and ſhelters it from the violent and nipping Winds, that generally nip and deſtroy much of the Corn, Pulſe, or whatſoever grows on the open Field or Champion Grounds, and preſerves it alſo from thoſe drying and ſcorching Winds more frequent in hot and dry Springs, much damaging the Champion Lands: It much preſerves that fertility and richneſs the Land is either naturally ſubject unto, or that is by the diligent care and coſt of the *Husbandman* added. It furniſheth the Owners thereof with a greater burthen of Corn, Pulſe, or what ever is ſown thereon: Alſo where it is laid down for Meadow or Paſture, it yields much more of Grals than the open Field-Land; and the Hedges being well planted with Trees, affords ſhelter and ſhadow for the Cattel both in Summer and Winter; which elſe would deſtroy more with their feet, than they eat with their mouths, and might loſe more of their fat or fleſh in one hot day, than they gain in three cool days; and affords the induſtrious *Husbandman* plenty

ty of Provision for the maintenance of Fire-boot, Plough-boot, Cart-boot; and (if carefully planted and preserved) furnishes him with Timber, Mast for his Swine, and Fruits for Syder, as we have in several other parts of this Treatise casually hinted.

It is one of the greatest Encouragements to good Husbandry, and a good Remedy against Beggery; for it brings Employment to the poor, by the continual labour that is bestowed thereon, which is doubly repaid by the fruitful crop it annually yieldeth, and generally maintains treble the number of Inhabitants or more than the Champion, as you may easily perceive if you compare such Counties and Places in *England*, that are for the most part upon Enclosure, with the Champion and Chilterne Counties or Places: And compare also the difference of their manner and condition of Living, and their Food and Apparel, *&c.* it must needs convince you that Enclosure is much to be preferred above the Champion, as well for the publique as private advantage. Our Predecessors were very sensible of the difference, as appears by what ingenious old *Tusser* (who took upon him Husbandry in *Edward* the Sixth's days) saith in his *Rythms* in his Comparison between *Champion Country*, and *Several*.

25. T'one barefoot and ragged doth go,
And ready in Winter to sterve;
When t'other ye see do not so,
But hath that is needful to serve.
T'one pain in a Cottage doth take,
When t'other trim Bowers do make.

26. T'one layeth for Turf and for Sedge,
And hath it with wonderful suit,
When t'other in every Hedge
Hath plenty of Fuel and Fruit;
Evils twenty times worser than these,
Enclosure quickly would ease.

27. In Wood-land the poor men that have
Scarce fully two Acres of Land,
More merrily live, and do save,
Than t'other with twenty in hand,
Yet pay they as much for the two,
As t'other for twenty must do.

The Differences also, and the Profits thereof, are plainly to be discerned and proved by the Severals, or enclosed Parcels of Land that have been formerly taken out of the Field-land or Commons, and how much they excel the other in every respect, though of the same Soil, and only a Hedge between; and what a yearly value they bear above the other.

And also by the great quantities of Lands that have within our memories lain open, and in common, and of little value, yet when enclosed, tilled, and well ordered, have proved excellent good Land, and suddenly repayed the present and greatest expence incident to Enclosure.

Of all which, and many other infinite Pleaſures, Contentments, and Advantages that Encloſure yields above the Champion and Field-Land, were they but ſenſible who ſo much affect and contend for the Champion, *&c.* they could never be ſo brutiſh as to perſiſt in ſo injurious and unthrifty a method of Huſbandry, both to themſelves, to their neighbors, to the poor, and to the Commonwealth in general.

Several Intereſts an Impediment.

This great Improvement meeteth with the greateſt difficulties and impediments; amongſt which none appears with a bigger face, than the ſeveral Intereſts and diverſity of Titles and Claims to almoſt every Common-field or waſte Land in *England*. And although (by many) the greater part of the Intereſted Perſons are willing to divide and incloſe it, yet if but one or more envious or ignorant perſon concerned oppoſe the Deſign, or that ſome or other of them be not by the Law under a capacity of aſſuring his Intereſt to his Neighbour, the whole muſt unavoidably ceaſe; which hath proved a general Obſtruction, and hath been frequently complained of: For the remedy whereof, a Statute to compel the Minor party to ſubmit to the Judgment and Vote of the Major, and equally to capacitate all perſons concerned for ſuch an *Enterpriſe*,, would be very welcome to the Country-man, wherein all particular Intereſts might be ſufficiently provided for; as well the Lord of the Soil, as the Tenant, and the poor.

High-ways an Impediment.

It is a common thing to have very many great and large High-ways over moſt of the *Common Fields* and *Waſte Grounds* in *England*, which prove a very great *Check* to the Deſigne of *Encloſure*, and may moſt eaſily be reduced, if a Statute may be obtained for that purpoſe, which was not long ſince in agitation, though not compleated; than which, as well for the Compulſion and Enabling of oppoſite and uncapacitated perſons, and providing for ſeveral Intereſts, as for the Regulating and right Diſpoſition of common and neceſſary Ways, no *Act* or *Statute* can be of greater or more *publique* Advantage to the Kingdom, in the more vulgar way or method of *Husbandry*.

Trees not thriving, an Impediment.

There are ſeveral Common-fields, Downs, Heaths, and Waſte Lands, that ſhould they be encloſed, it would be very difficult, and in ſome places ſeem impoſſible to advance or propagate any quick Fences, or conſiderable quantity of Trees, as before is hinted at, by reaſon of the great drought ſuch Land is ſubject unto in the Summer, aud deſtructive cold Winds in the Winter and Spring. To which we reply, That after, or according to the uſual manner of Planting, ſuch Trees or Hedge-rows come to little, becauſe the young Cions they remove, are commonly brought from a fertile, warm, or moiſt Soil, into a cold, barren, or dry; which muſt needs produce ſuch an inconvenience.

Alſo they oftentimes plant Trees not naturally agreeing with the Soil they remove them into, or elſe plant them deep into the barreneſt part of the Earth; or at leaſt take little or no care to defend them (when planted) from the external Injuries of Drought, Cold, *&c.*

But

But if any are willing, or intend to raise a Quick-fence, or propagate Trees on such open Land subject to such Inconveniences, the only way is to raise a sufficient quantity before-hand in a Nursery for that purpose, of such Trees or Plants that naturally delight in that Land where you intend to plant them, and then to place them in such order, (as you will finde hereafter described in the Chapter of *Woods*) that the Roots be not below the best Soil; and that they have a sufficient Bank to shelter them on the one side, and an artificial dry Hedge on the other, which may be continued till the quick Plants are advanced above common Injuries: Or you may sowe the Seeds of such Trees you intend to propagate in Furrows, made and filled with a good Earth, and secured from Cattle, either by a double Hedge, or by ploughing the Land for several years; and not feeding the same with Cattle, till such time as the Trees are grown up, which will soon repay the imaginary loss of the Herbage, or Grasing, especially if the young Cions be (the first and second years of their growth) a little sheltered from the sharp Winds, by shattering a little Straw, Brake, or Hawm lightly over them, which will also rot, and prove a good Manure, and qualifie the heat and drought of the Summer.

And when once you have advanced an indifferent Bank, Hedge, *&c.* about your new Enclosures, you may much more easily plant and multiply Rows and Walks of Timber, Fruit, and other necessary Trees, the destructive edge of the cold Winds being abated by the Hedges, *&c.* We frequently have observed on several high and supposed barren Hills and Plains, Woods and Trees flourish; and in open Fields or Gardens within the shelter of those Woods, Trees and other Plants prove as well as in the lower Valleys; that it is enough to convince any rational person, that by Enclosure only, may most, if not all the Open, Champion, Plain, Waste, and supposed barren Lands in *England*, be highly improved and advanced to an equal degree of Fertility to the Enclosures next adjacent, using the same good Husbandry to the one as to the other; which can never be whilest it is in Common.

Dividing Land into small parcels an Improvement.

It is observed that of most sorts of Land, by how much the smaller the Enclosure or Crofts are, the greater yearly value they bear, and the better burthen of Corn or Grass, and more flourishing Trees they yield; and the larger the Fields or Enclosures are, the more they resemble the Common Fields or Plains, and are most subject to the like inconveniencies. We generally finde that a Farm divided into many Severals, or Enclosures, yields a greater Rent, than if the same were in but few.

Enclosing of watred Meadows not an Improvement.

Too many Hedges and Banks in rich or watered Meadows waste much Land, and injure the Grass by their shadow, & by dripping, for that needs no shelter: Grass abides any weather; and in case the cold Spring keeps it back, it fears not drought, but hath water and heart sufficient to bring it forwards, unless you plant such proving *Aquatick* Trees, whose shrowds shall exceed in value the Grass they injure; which may well be done in Rows, and on the edges

edges of the Banks, *&c.* and will amount unto a conſiderable Improvement, if you ſelect the right kinds.

Wheat in Encloſures ſubject to Mildew.

That Wheat ſown in Encloſures, or any Land under the Winds, is ſubject to *Mildew*, is a general opinion amongſt Huſbandmen: And the only great Inconveniencie Encloſure is ſubject unto, Mr. *Hartlib* ſaith, is *Mildew*. But this is only an injury to one ſort of Grain; Neither is it yet certain that Encloſure is the cauſe, for we finde and obſerve that Wheat in the Fielden Country is ſubject to *Mildews*, though not ſo frequent as in the Encloſure, by reaſon that the Land is not ſo rich generally, nor ſo moiſt as Encloſures are, which in Summer-time emit a greater quantity of that Moiſt *Spirit*, or *Univerſal Matter of Vegetables* (whereof we diſcourſed before) than the dry, hungry, open Field-Land doth; which being coagulated in the Air, falls in form of a Dew, ſometimes on the Oak, and is then food for Bees; ſometimes on Hops and on Wheat, whether high or low, encloſed or open: Nay, ſometimes on the one half of a Hop-garden, or a Wheat-field, and not on the other.

Legacie.

But *Blaſting* hath commonly been miſtaken for *Mildew*, Wheat being ſubject alſo to it in the beſt and richeſt Lands in moiſt years, (whereof more in another place) ſo that we cannot finde Encloſure only to be the cauſe of either *Blaſting* or *Mildew*, other than that it is the richeſt and beſt Land. Alſo we may obſerve, that in the Wood-lands, or Countries where moſt Encloſure is, there the Land yields the greateſt burthen of Wheat, as well as other Grain, and more rarely fails than in the Champion Country; wet Summers being not ſo frequent as dry; the *Vales* and *Encloſures* alſo being by far the greater Support of our Engliſh Granary, than the Open, Champion, and the Hills; which yields us, 'tis true, the greater part of our Drink-corn, delighting in the more hungry Soil, and proves a good Supply in a wet Summer for the other.

CHAP.

CHAP. III.

Of Meadow and Pasture Lands, and the several ways of their Improvements, either by watring or drowning; or by sowing or propagating several sorts of extraordinary Grasses or Hays, &c.

Meadow and *Pasture* Lands are of so considerable use and advantage to the Husbandman, that they are by some preferred above Arable, in respect of the advantage they bring annually into his Coffers, with so little Toll, Expence and Hazard, far exceeding in value the Corn Lands; and of principal use for the Encrease and Maintenance of his Cattle, his better food, and the chiefest strength he hath for the Tilling and Improving his other Lands: *Meadow* and *Pasture* Lands are generally of two sorts, *Wet* or *Dry*; the *Wet Meadows* are such, that the Water overflows or drowns at some times of the year; under which term we shall comprehend all such Meadows, or other Lands that are artificially watred or over-flown, or that are under that capacity of Improvement. The *Dry Meadows* or *Pastures* are such that are not over-flown or watered by any River or Stream, under which we shall comprehend all such *Inclosures* or *Severals* that lie warm and in a fertile Soil, yielding an annual burthen of Hay or Grass, or that are capable of Improvement, by sowing or propagating of new Grasses, Hays, *&c.* or other ways of Improvement.

SECT. I.

Of the Watring of Meadows.

Of *Wet Meadows* or Land under that capacity of being overflown or watred, there are several sorts.

First, Such Meadows that lie generally flat on the Banks of great Rivers, and are subject to the over-flowing of such Rivers in times of Land-floods only.

Secondly, Such Meadows that lie near to lesser River or Streams, and are capable of being drowned or watered by diverting such River, or some part thereof out of its natural Current over the same.

Thirdly, Such Meadows or Lands that lie above the level of the Water, and yet are capable of Improvement by raising the Water by some artificial ways or means over them.

All which sort of Meadows or Lands under those capacities are very much improved by the Water over-flowing them, as every Country and place can sufficiently evidence and testifie,

Hu-

Virgil. —— *Humida Majores herbas alit.* ——

Neither is there ſcarcely any Kingdom or Country in the World, where this is not eſteemed an excellent Improvement. How could *Egypt* ſubſiſt, unleſs *Nilus* did annually Fertilize its Banks by its Inundation? Several other Potent and wealthy Countries there are in thoſe *African* and *Aſian* Territories, whoſe richeſt and moſt Fertile Lands are maintained in their Fertility by the Sediment of the over-flowing Waters.

Virgil. —— *Hinc ſummis liquuntur rupibus Amnes*
Felicemque trahunt limum.

But theſe are Natural; yet are not ſome Countries without their Artificial ways of advancing this ponderous Element to a very conſiderable Improvement, as *Perſia*, *Italy*, &c. abound with moſt ingenious ways for the raiſing of the water, as well for their Meadows as other neceſſary uſes.

Of Meadows watred by Floods. On the Banks and Borders of our great Rivers and Currents, are the moſt and richeſt Meadows, conſiſting generally of a very good fat Soil, as it were compoſed of the very Sediment of the Water overflowing the ſame, after great and haſty Rains; ſuch Meadows are capable of very little Improvement, eſpecially thoſe that border on the greater Rivers, as *Thames*, *Severn*, *Trent*, *Ouſe*, &c. uncapable of obſtruction at the pleaſure of the Huſbandman.

Yet where ſuch *Meadows* lying on the borders of great *Rivers* are of a dry and hungry Soil, and not frequently overflowed by Land-floods, may Artificial Works be made uſe of for the raiſing the water over the ſame, to a very conſiderable advantage: whereof more hereafter in this Chapter.

Of Meadows watered by diverſion of Rivers, &c. Other *Meadows* there are, and thoſe the moſt general in *England*, that border on the leſſer *Rivers*, *Streams*, &c. and in many places are overflown or drowned by diverting the Water out of its natural and uſual Current over them: This is of late become one of the moſt univerſal and advantageous Improvements in *England* within theſe few years, and yet not comparable to what it might be advanced unto, in caſe theſe ſeveral Obſtructions were removed that impede this moſt noble and profitable Improvement.

Hinderances to drowning. *Firſt*, The ſeveral Intereſts that are in Lands bordering on Rivers, hinder very much this Improvement, becauſe the *Water* cannot be brought over ſeveral quantities of Land under this capacity, but through the Lands of ignorant and croſs Neighbours, who will not conſent thereunto (although for their own advantage alſo) under unreaſonable terms; and ſome will not at all: others are not by the Law capacitated for ſuch conſent (as we noted before concerning Encloſures.)

Secondly, That great and pernicious impediment to this Improvement, Mills ſtanding on ſo many fruitful Streams, prohibiting the Laborious and Ingenious Huſbandman to receive the benefit

benefit and advantage of ſuch Streams and Rivers, carrying in their bowels ſo much Wealth into the *Ocean*, when the *Mills* themſelves yield not a tenth of the profit to the Owners that they hinder to their Neighbours, and their work may as well be performed by the *Wind* as by the *Water*; or at leaſt the Water improved to a better advantage, by facilitating the Motion of the *Mill*; whereof more hereafter.

Thirdly, Another grand Impediment is the Ignorance of the *Countrey-men*, who in many places are not capable of apprehending neither the Improvement, nor the cauſe thereof: But becauſe ſome certain Neighbours of theirs had their Land overflown a long time, and was little the better, therefore will they not undergo that charge to ſo little purpoſe; or becauſe they are commonly poſſeſſed with a fooliſh opinion, that the *Water* leaves all its fatneſs on the Ground it flows over, and therefore will not advantage the next; which is moſt untrue; for I have ſeen Meadows ſucceſſively drowned with the ſame *Water*, to almoſt an equal Improvement for many miles together. It is true, the *Water* leaves its fatneſs it hath waſhed from the *Hills* and *High-ways* in the time of great Rains; but we finde by daily experience, that Meadows are fertilized by overflowing as well in froſty, clear, and dry weather, as in rainy, and that to a very conſiderable Improvement: And alſo by the moſt clear and tranſparent Streams are improved ordinary Lands, that they become moſt fertile Meadows.

Fourthly, From a greedy and covetous Principle, they ſuffer the *Graſs* to ſtand ſo long on the watered *Meadows*, that it is much diſcoloured and grown ſo hawmy, and neither ſo toothſom nor wholeſome, as that on unwatered Meadows; which brings an ill name on the Hay; which if cut in time would be much better, and in moſt watered *Meadows* as good as any other; And the *After-graſs*, either to mow again, or to be fed on the place, will repay the former ſuppoſed Loſs.

The former *Impediments* may with much facility be removed by a Law, which would be of very great Advantage to the Kingdom in general. The *later* only by the good *Examples* and *Preſidents* of ſuch induſtrious and worthy Perſons that underſtand better things; the generality of the world being rather introduced to any ingenious and profitable Enterpriſe by Example than by Precept; although ſome are ſo ſordid and ſelf-willed, that neither apparent Demonſtration, nor any convincing Argument whatſoever, can divert them from their *Byaſs* of Ill-huſbandry and ignorance: whom we leave.

Of Meadows watered by artificial Engines.

On the Borders or Banks of moſt Rivers or Streams, lie ſeveral Pieces of Land that are not capable of being overflown by the obſtruction or diverſion of the Water, without a greater injury than the expected advantage would recompence; which may notwithſtanding be improved very conſiderably, by placing of ſome Artificial Engine in or near ſuch River or Stream, for the overflowing thereof.

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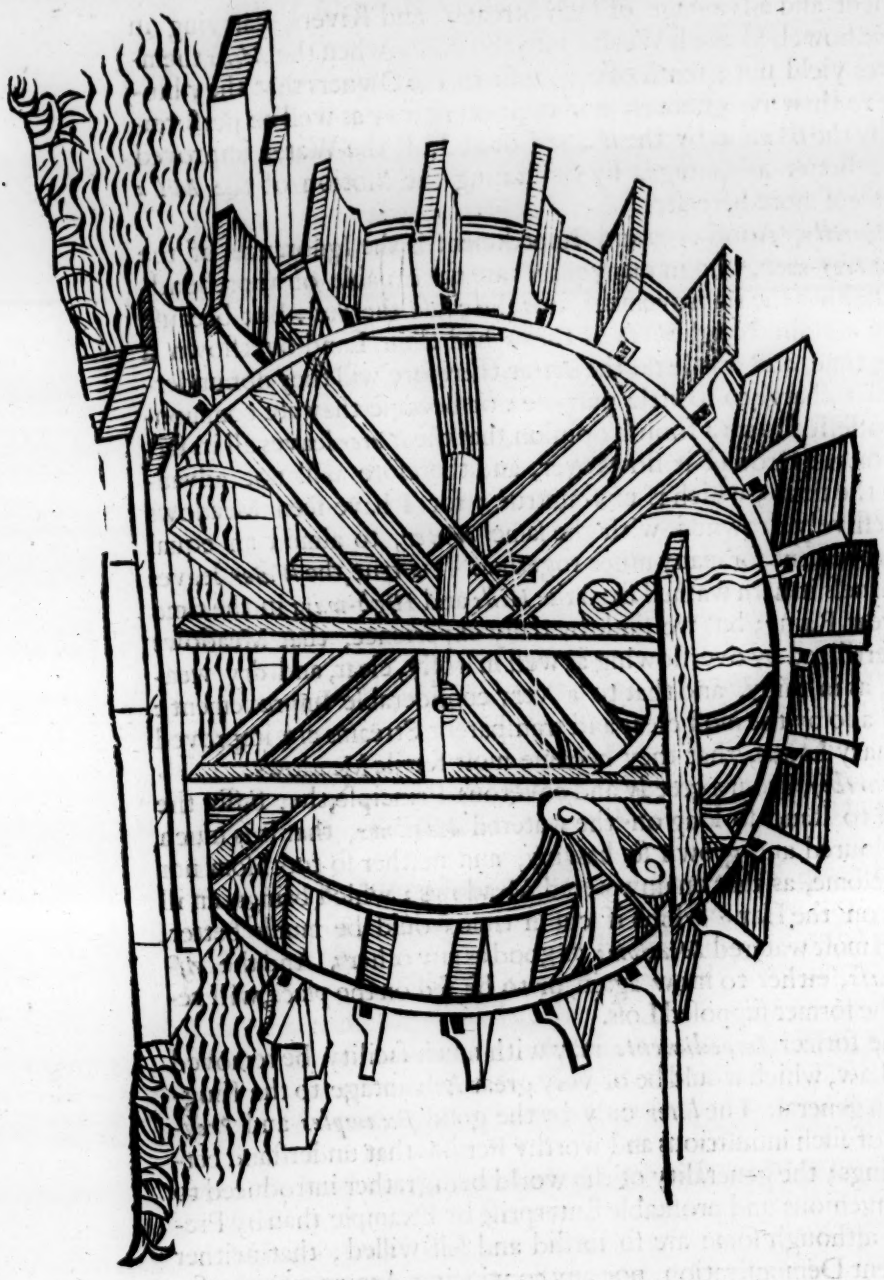


The Perſian Wheel.

Of the Perſian Wheel.

The moſt conſiderable and univerſal is the *Perſian Wheel*, much uſed in *Perſia*, from whence it hath its name, where they ſay there are two or three hundred in a River, whereby their Grounds are improved extraordinarily: They are alſo much uſed in *Spain*, *Italy*, and in *France*, and is eſteemed the moſt facile and advantageous way of raiſing Water in great quantity to any Altitude within the *Diameter* of the Wheel, where there is any current of Water to continue its motion; which a ſmall ſtream will do, conſidering the quantity and height of the Water you intend to raiſe.

This

This way, if ingeniouſly proſecuted, would prove a very conſiderable Improvement; for there is very much Land in many places lying near to Rivers that is of ſmall worth, which if it were watred by ſo conſtant a ſtream as this *Wheel* will yield, would bear a good burthen of Hay, where now it will hardly bear Corn.

How many Acres of Land lie on the declining ſides of hills by the Rivers ſides, in many places where the Water cannot be brought unto it by any ordinary way? yet by this Wheel placed in the *River* or *Current*, and a Trough of Boards ſet on *Treſſles* to convey the Water from it to the next place of near an equal altitude to the Ciſtern, may the Land be continually watred ſo far as is under the level of the water.

Alſo there is very much Land lying on the borders of Rivers that is flat and level, yet neither doth the Land-floods overflow the ſame, or at moſt but ſeldom; nor can the water be made by any obſtruction thereof, or ſuch-like way to overflow it. But by this *Perſian Wheel* placed in the *River* in the neareſt place to the higheſt part of the Land you intend to overflow, therewith may a very great quantity of water be raiſed: For where the Land is but little above the level of the *Water*, a far greater quantity of Water, and with much more facility may be raiſed, than where a greater height is required; the Wheel eaſier made, and with leſs expence.

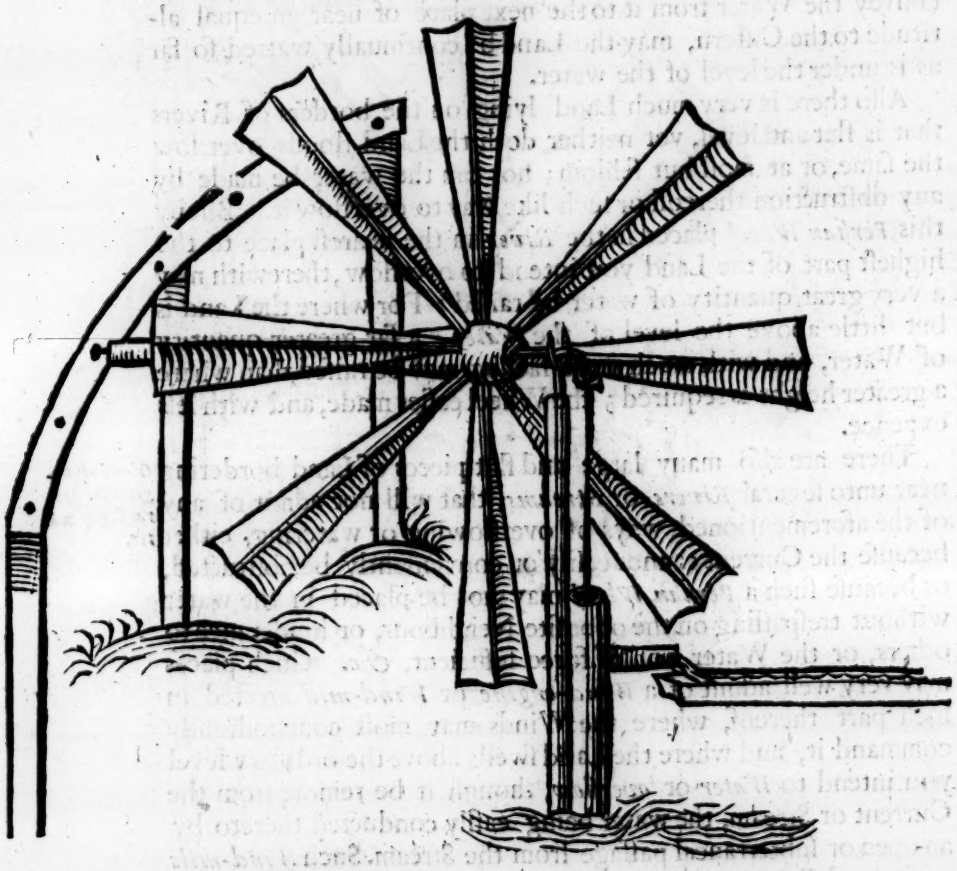
Of Wind-Engines for the raiſing of water.

There are alſo many large and flat pieces of Land bordering near unto ſeveral *Rivers* or *Streams*, that will not admit of any of the aforementioned ways of overflowing or watering, either becauſe the Current cannot eaſily or conveniently be obſtructed, or becauſe ſuch a *Perſian Wheel* may not be placed in the water without treſpaſſing on the oppoſite Neighbour, or hinderance to others, or the Water not of force ſufficient, *&c.* which places may very well admit of a *Wind-engine* or *Wind-mill* erected in ſuch part thereof, where the Winds may moſt commodiouſly command it, and where the Land ſwells above the ordinary level you intend to *Water* or *overflow*, though it be remote from the Current or Stream, the water being eaſily conducted thereto by an open or ſubterraneal paſſage from the Stream. Such *Wind-mils* raiſing a ſufficient quantity of water for a reaſonable height for many Acres of Land, muſt needs prove a very conſiderable advantage to the owner, as well for the overflowing thereof, as it hath done to many for the draining large Fens of great quantities of water to a conſiderable height: Neither is it altogether neceſſary that ſuch Land be wholly plain, and open to all Winds; for in Vallies that are on each ſide defended with Hills, or in ſuch Lands that are on ſome ſides planted with Woods, may ſuch *Wind-mills* well be placed, where the wind may at ſome certain ſeaſons perform its work ſufficiently, though not ſo continually as where the place is free to all winds.

What Wind-mills are beſt for this work.

Several have been the Inventions of Ingenious men to accompliſh this deſigne, and much have they promiſed to perform; ſome

ſome by the *Horizontal Windmill*, and by a Wheel with Buckets or Scoops fixed unto chains; Alſo by a Wheel carrying the Water up in Buckets fixed thereto, and caſting the ſame forceably from it by the ſwiftneſs of its motion: Others by the perpetual Screw, which you may finde mentioned or delineated in Mr. *Bliths Engliſh Improver Improved.* But there is none ſeems to me more feaſable, leſs expenſive, of longer continuance without repair or danger of Winds, nor more effectual to raiſe much Water with little Wind, than Vertical Sails like the ordinary Wind-mills,



only more in number, and not ſo long, placed on an *Axis* of a length proportionable to the length of the *Vanes*; the one end reſting on an Iron fork upon the top of a ſingle poſt, the other end moveable to ſeveral points on a Quadrant of a Circle, that be the *Wind* which way it will, by only moving the one end of the Axis on the Quadrant, it will be direct to the one or the other ſide of the *Vanes* or *Sayls*. Under the end of the Axis that reſts on the ſingle Poſt, let there be a Pump placed in the Water you intend to raiſe, the head of the Pump not riſing much above the place or paſſage to convey it away; which Pump may be made of what Diameter you pleaſe, according to the ſtrength of your Wind-mil, and height you raiſe the Water: you may make the

trunk

trunk of the Pump round; or if you would have it large, then ſquare may ſerve as well as round: let the Bucket always dip into the level of the Water, which prevents much trouble and injury to the work: let the handle of the Pump extend in length to the *Axis* of the Wind-mil, which muſt be made crooked, to receive and move the ſame, like unto the *Axis* of a Cutlers Grinding-ſtone or Dutch Spinning-wheel turned with the foot, which *Wind-mill* or *Engine* by any reaſonable Gale of Wind will raiſe a very great quantity of Water (proportionable to its ſtrength and height) with eaſe; being made for a very ſmall charge, conſidering other coſtly Engines; is compoſed of very many parts, and therefore requires the leſs repair, and is the leſs ſubject to damage by violent Winds; and is eaſily managed, and therefore the more ſutable to our Country-men, who uſually reject any thing, though never ſo excellent, if it be difficult.

SECT. II.

The Principal Rules neceſſary to be obſerved in Overflowing or drowning of Lands.

When you have raiſed or brought the Water by any of the aforeſaid means to the height you expected, then cut your main Carriage, allowing it a convenient deſcent to give the Water a fair and plauſible Current all along; let the mouth of the main Carriage be of breadth (rather than depth) ſufficient to receive the whole Stream you deſire, or intend; and when you come to uſe a part of your Water, let the main Carriage narrow by degrees, and ſo let it narrow till the end, that the Water may preſs into the leſſer carriages, that iſſue all along from the main. 1 *In cutting the main Carriage.*

At every riſing ground or other convenient diſtances you ought to cut ſmall tapering Carriages, proportionable to the diſtance and quantity of Land or Water you have, which are to be as ſhallow as may be, and as many in number as you can: for although it ſeems to waſte much Land by cutting ſo much turf, yet it proves not ſo in the end; for the more nimbly the Water runs over the Graſs, by much the better the Improvement is, which is attained by making many and ſhallow Carriages. 2 *In cutting the leſſer Carriages.*

Another principal obſervation in Drowning, or Watering of Lands, is to make *Drains* to carry off the Water the *Carriage* brings on, and therefore muſt bear ſome proportion to it, though not ſo large; and as the leſſer Carriages conduct the Water to every part of your Land, ſo muſt the leſſer Drains be made amongſt the Carriages, in the loweſt places, to lead the Water off, and muſt widen as they run, as the Carriages leſſened; for if the Water be not well drained, it proves injurious to the Graſs, by ſtanding in pools thereon; in the Winter it kills the Graſs, and in the Spring or Summer hinders its growth, and breeds Ruſhes, and bad Weeds; which if well drained off, works a contrary effect. 3 *In making the Drains.*

Some

4 Times for watring or drowning of Land.

Some graze their Lands till *Chriſtmaſs*, ſome longer; but as ſoon as you have fed it bare, then is it beſt to overflow: from *Alhallontide* throughout the Winter may you uſe this Huſbandry, until the Spring that the Graſs begin to be large: during *April* and the beginning of *May*, in ſome places may you give the Graſs a little water once a week, and it will prove wonderfully, eſpecially in a dry Spring. In Drowning, obſerve that you let not the water reſt too long on a place, but let it dry in the intervals of times, and it will prove the better; nor let Cattle tread it whil'ſt it is wet.

In the Summer if you deſire to water your Land, let it be in mild or Cloudy weather, or in the night-time, that the water may be off in the heat of the day, leſt it ſcorch the Graſs, and you be fruſtrate of your expectation.

5 Manner of watring of Land by ſmall ſtreams or Engines.

In many places you may have the opportunity to command a ſmall Spring or Stream where you cannot a larger, or may obtain water by the Engines before-mentioned, which may not be ſufficient to overflow your Land in that manner, nor ſo much to your content as the greater Currents may; therefore you muſt make your Carriages ſmall according to your water, and let there be ſeveral ſtops in them, that you may water the one part at one time, and another part at another: alſo in ſuch dry and ſhelving Lands where uſually ſuch ſmall Springs are, and water by ſuch artificial ways advanced, a ſmall drilling water, ſo that it be conſtant, worketh a wonderful Improvement.

6 Barren Springs not uſeful.

In ſome places iſſue Springs whoſe waters are ſterile, and injurious to the Huſbandman, as are uſually ſuch that flow from *Coal-mines*, or any *Sulphureous* or *Vitrioline Minerals*, being of ſo harſh and brackiſh a ſubſtance, that they become deſtructive to Vegetables: Not but that thoſe Minerals, and alſo thoſe waters contain much of that matter which is the cauſe, and of the principles of Vegetation, though not duly applied, nor equally proportionated, as much Urine, Salt, *&c.* kills Vegetables; yet duly fermented, and artificially applied, nothing more fertile. Such Springs that you ſuſpect, prove them firſt before you go too far: thoſe that are bad are uſually reddiſh in colour, and leave a red ſediment, and ſhine as it runs, and is not fertile until it hath run far, and encreaſed it ſelf from other Springs, and gained more fertility in its paſſage; as we uſually obſerve greater Rivers, though reddiſh in colour, yet make good Meadow.

SECT. III.

Of dry Meadow or Paſture.

Every place is almoſt furniſhed with dry Meadows, which are convertible ſometimes into Meadows, and ſometimes into Paſtures; and ſuch places much more where Waters, Springs and Rivolets are ſcarce, or the Rivers very great, or the Country hilly, that water cannot ſo well be commanded over ſuch Lands as in other places they may: which dry Meadows and Paſtures are capable of Improvement by ſeveral ways.

And

And principally by Encloſure; for where ſhall we finde better dry Meadows, and richer Paſtures, than in ſeveral hilly places of *Somerſetſhire*, among the ſmall Encloſures? which not only preſerveth the young Graſs from the exſiccating Spring-winds, but ſhadoweth it alſo in ſome meaſure from the Summer-ſcorching Sun-beams, as before we noted in the Chapter of *Encloſure*. Such Meadows or Paſtures well planted with either Timber or Fruit-trees in the Hedge-rows, or other convenient places, and enclo-ſed in ſmall parcels, will furniſh you with good Hay and good Paſture, when your Neighbour whoſe Lands are naked, goes without it; for dry Springs or Summers more uſually happen than wet; beſides the ſhadow for your Cattle, and many other advantages, as before we obſerved. *Improved by Encloſure.*

In ſeveral places where the ground is moiſt, cold, clay, ſpewy, ruſhy or moſſie, or ſubject to ſuch inconveniencies, that the Paſture or Hay is ſhort, ſower, and not proveable, it is very good Huſbandry to pare off the turf about *July* or *Auguſt*, and burn the ſame (after the manner as is hereafter deſcribed when we come to treat of burning of Land) and then plough it up immediately, or in the Spring following, and ſowe the ſame with Hay-duſt, or with Corn and Hay-duſt together; for by this means will that acid Juice that lay on the ſurface of the Earth, which was of a ſterile nature, and hindred the growth of the Vegetables, be evaporated away, and alſo the Graſs which had a long time degenerated by ſtanding in ſo poor a Soil, be totally deſtroyed, and the Land made fertile, and capable to receive a better ſpecies brought in the Seed from other fertile Meadows. *Burning of Ruſhy and Moſſie ground.*

It is too commonly obſerved that many excellent Meadows, or Paſture-land, are ſo plentifully ſtored with Shrubs, ſmall Hillocks, Ant-hills, or ſuch like, that a good part thereof is wholly loſt, and ſo much thereof as is mown is but in patches here and there, and that that remains not ſo beneficial as if it were either mown or fed together. Now the beſt way or Method of ſtubbing up ſuch thorny Shrubs, or Broom, or Goſs, or any ſuch annoying Shrubs, which proves both laborious and coſtly any other way than this, is ingeniouſly delivered by *Gabriel Platt*: the Inſtrument by him diſcovered is like a three-grained dung-fork only, but much greater and ſtronger, according to the bigneſs of the Shrubs, *&c.* the ſtale thereof like a large and ſtrong Leaver; which Inſtrument being ſet half a foot or ſuch reaſonable diſtance from the Root of the Shrub, *&c.* then with a Hedging-beetle drive it in a good depth; then elevate the Stale, and lay ſome weight or fulciment under it, and with a Rope faſtened to the upper end thereof, pull it down, which will wrench up the whole buſh by the Roots. Alſo Ant-hills prove a very great annoyance to Paſture, and Meadow-lands, which may be deſtroyed by dividing the Turf on the top, and laying of it open ſeveral ways; then take out the core, and ſpread over the other Land, and lay the Turf down neatly in its place again, a little hollowing in, and lower than the ſurface of the Earth; and at the beginning of the *Stubbing up of ſhrubs, &c.* *Diſcovery of hidden Treaſures.*

the Winter the Water ſtanding therein will deſtroy the remainder of the Ants, and prevent their return, and ſettle the Turf by the Spring, that by this means may a very great Improvement be made of much Meadow or Paſture-land, now a great part thereof Buſhes and Ant-hills.

Dunging or Soyling of Meadows and Paſtures.

Theſe Meadows and Paſture-lands where the water overfloweth not at any time, are the only places where you may lay your dung, or other Manure to the beſt advantage, it being not capable of being improved by water, nor the Soil laid thereon ſubject to be carried away, or at leaſt the better part thereof extracted by the water, either caſually by Floods, or any other way overflowing the ſame.

Time for Soyling.

The beſt time for the Soiling of Meadows and Paſture-lands is in the Winter-ſeaſon about *January* or *February*, that the rains may waſh to the Roots of the Graſs the fatneſs of the Soil, before the Sun drieth it away: and diſſolve the clots, that may be ſpread with a Buſh drawn over it like a Harrow, before the Graſs be too high.

Soyl for Ruſhy and cold Land.

Aſhes of Wood, Peat, Turf, Sea-coal, or any other Fewel, is very proper to be laid on Cold, Spewey, Ruſhey, and Moſſie Land (not ſandy or hot) and ſuits beſt therewith, and agrees with the Huſbandry of burning the Turf, as is before adviſed: the dung of Pigeons, or any other Fowl, works a better effect on that than other Lands; alſo all hot and ſandy Soils are fitteſt for that ſort of Lands.

For ſandy or hot Land.

Lime, Chalk, Marle, or any cold foſſile Soils, are an extraordinary Improvement to dry, ſandy, hot Lands of a contrary nature or temperature, as well for Meadow and Paſture, as for Corn-Land: I have ſeen much of the blew Clay, which they call *Urry*, that's digged out of the Coal-mines, and lies near the Coal, laid on Meadow and Paſture-lands, to a very conſiderable advantage. Many inſtances of wonderful Improvements made by mixing of Soils of contrary natures, you may finde in ſeveral of our modern *Rural Authors*.

For other Meadows.

Between theſe two extremes, your ordinary dung or Soil is beſt beſtowed on your Meadows and Paſtures, not ſo much inclining either way; for it is a very principal part of good Huſbandry to apply the Soil or Compoſt properly, as the nature of the ground requireth; whereof you may finde more hereafter, in the Chapter of Soils, Dungs, *&c.*

SECT. IV.

Of ſeveral new Species of Hay or Graſs.

It is found by daily experience, not only in forein parts, but in our own Country, that a very great Improvement may be made on the greater part of our Lands, by altering the ſpecies of ſuch Vegetables that are naturally produced, totally ſuppreſſing the one, and propagating another in its place, which may rejoyce and

and thrive better there than that before, as we evidently ſee by Corn ſowen on Land where hardly Graſs would have grown, what a Crop you reap; but theſe are but Annuals: that which raiſes the greateſt advantage to the Huſbandman, is what annually yields its increaſe without a renovation of expence in Ploughing and ſowing; as we finde in the *Clover-graſs* or great *Trefoyl*, *St. Foyn* or *Holy-Hay*, *La Lucern*, *Spurrey-ſeed*, *Trefoyl*, *None-ſuch*, &c. whereof apart.

This Graſs hath born the name, and is eſteemed the moſt principal of Graſs, both for the great Improvement it brings by its prodigious Burthen, and by the excellencie of the Graſs or Hay for Food for Cattle, and is much ſowen and uſed in *Flanders* and in *Holland*, Preſidents to the whole world for good Huſbandry. *Of the* Clover-graſs.

In *Brabant* they ſpeak of keeping four Cows Winter and Summer on an Acre, ſome cut and laid up for Fodder, others cut and eaten green: here in *England* they ſay an Acre hath kept four Coach-horſes and more all Summer long; but if it kept but two Cows, it is advantage enough upon ſuch Lands as never kept one. You may mow the firſt Crop in the midſt or end of *May*, and lay that up for Hay; if it grow not too ſtrong, it will be exceeding good and rich, and feed any thing: then reſerve the next for Seed, which may yield four Buſhels upon an Acre, each Buſhel being worth three or four pound a Buſhel, which will amount to the reputed value of ten or twelve pounds *per* Acre; and after that Crop alſo it may be fed. It hath alſo this Property, that after the growing of the *Clover-graſs* three or four years, it will ſo frame the Earth, that it will be very fit for Corn again, which will prove a very great Advantage, and then again for *Clover*. Thus far Mr. *Blith*. Others ſay it will laſt five years, and then alſo yield three or four years together rich Crops of Wheat, and after that a Crop of Oats. *Engliſh Improver.*

In the Annotations upon Mr. *Hartlibs Legacie*, we finde ſeveral Computations of the great Advantage hath been made by ſowing *Clover-graſs*, as that a parcel of Ground, a little above two Acres, the ſecond year, did yield in *May* two Load of Hay worth five pounds: the next Crop for Seed was ripe in *Auguſt*, and yielded three very great Loads worth nine pounds that year; the Seed was 300 l. which with the Hay was valued at thirty pounds, beſides the after-Paſture. Another Preſident is, that on four Acres there grew twelve Loads of Hay at twice mowing, and twenty Buſhels of Seed; one Load of the Hay mown in *May* being worth two Load of the beſt of other Hay, and the After-paſture three times better than any other; the four Acres yielded in one year fourſcore pound. Another, that ſix Acres of *Clover* did maintain for half a year thirteen Cows, ten Oxen, three Horſes, and twenty ſix Hogs; which was valued at forty pound, beſides the Winter-Herbage.

The aforeſaid Preſidents and Valuations ſeem prodigious, unleſs a rich, light Land, warm and dry, be ſown therewith, in which *The beſt Land for* Clover-graſs.

it principally delighteth; and then it may probably anſwer the ſaid Valuations, and muſt needs be a very high Improvement, although the Ground were good and profitable before. It will alſo proſper and thrive on any Corn-land, well manured or ſoiled, and brought into perfect Tillage. Old Land, be it courſe or rich, long untilled is beſt for Corn, and beſt and moſt certain for *Clover-Graſs*; and when you have Corned your Land as much as you intend, then to ſowe it with *Clover* is the propereſt ſeaſon: Land too rich for Corn, cannot be too rich for *Clover*. Poor Lands are not fit for *Clover*, unleſs burnt or denſhired, as we ſhall hereafter direct; or limed, marled, or otherwiſe manured, and then will it bring forth good *Clover*.

Quantity of Seed for an Acre.

An Acre of Ground will take about ten pounds of your *Clover-Graſs* Seed, which is in meaſure ſomewhat above half a peck, according to Sir *Richard Weſton*. The quantity of Seed for an Acre Mr. *Blith* conceives will be a Gallon, or nine or ten pounds; which agrees with the other: But if it be huſky (which ſaves labour in cleanſing of it, and alſo ſowes better by filling the hand, than mixed with any other thing) you muſt endeavor to finde out a true proportion according to the cleanneſs or foulneſs you make it: but be ſure to ſowe enough, rather too much than too little; for the more there is, the better it ſhadows the Ground: Some have ſowen fifteen pound on an Acre with good ſucceſs; ten pound ſome judge to be of the leaſt, however let the Seed be new and of the beſt, which the Engliſh is eſteemed to be.

The time and manner of ſowing Clover-graſs.

The uſual way is thus adviſed: when you have fitted your Land by Tillage and good Huſbandry, then ſowe your *Barley* and *Oats*, and harrow them; then ſowe your *Clover-graſs* upon the ſame Land, and cover it over with a ſmall Harrow or Buſh, but ſowe not the Corn ſo thick as at other times the Land uſually requires. The principal ſeaſons for the ſowing thereof are the end of *March*, and throughout *April*. Sir *Richard Weſton* adviſeth to ſowe the *Clover-ſeed* when the *Oats* begin to come up; alſo that you may ſowe it alone without any other Seed or Grain, and that it will be ready to cut by the firſt of *June* the firſt year. It is alſo obſerved that *Poliſh Oats* are the beſt Corn to be ſowen with *Clover* about the middle of *April*: two Buſhels and a half, or three Buſhels to an Acre, which will yield a middle Crop of *Oats* at Harveſt, and ſhadow the *Clover* from the heat of the Sun; which will be a notable Paſture in *September* or *October* following.

Of cutting it for Hay and for ſeed.

About the midſt or end of *May*, may you cut the firſt Crop for Hay; which takes up more time and labour to dry it than ordinary Hay, and will go very near together: yet if it grow not too ſtrong, it will be exceeding rich and good, and feed any thing. The exact time of cutting is when it begins to knot, and then will it yield good Hay, and ere the year be about it may yield you three ſuch Crops; and afterwards feed it with Cattle all the Winter, or until *January*, as you do other Ground: But if you intend to preſerve the Seed, then you muſt expect but two Crops that year; the firſt Crop as before, but the ſecond muſt ſtand till the Seed be come

come to a full and dead ripeneſs, for it will not be very apt to ſhed. When firſt you can obſerve the Seed in the Huſk, about a moneth after it may be ripe, and then the Seed begins to change its colour, and the Stalk begins to die and turn brown; and being turned to a yellowiſh colour, in a dry time mow it, and preſerve it till it be perfectly dry. In ſome years it ripens ſooner than in other, therefore you need not be preciſe as to the time, but to the ripeneſs of it. The Stalks or Hawm after you have thraſhed out your Seed, Cattle will eat; but if they be too old and hard they will not. Some direct to boyl them, and make a Maſh of them, and it will be very nouriſhing, either for Hogs, or any thing that will eat thereof. Others reject the Stalks as uſeleſs, and eſteem the Seed only to be a ſufficient Advance of that Crop. If after two years ſtanding of *Clover-graſs* you ſuffer the later Crop to ſhed its Seed, you will have your Land new ſtored with *Clover*, that you need not convert it to other uſes. *Sir Richard Weſton.*

One Acre of this *Graſs* will feed you as many Cows as ſix Acres of other common Graſs, and you will finde your Milk much richer, and exceeding in quantity, and fattens very well: The beſt way of feeding of it, and as is reported is the uſual way in *Holland* and *Flanders*, is to cut it daily as your Cattle ſpend it, and give it them in Racks under ſome Trees, or in ſome Shed or Outhouſe, for the Cattle will injure it much with their feet, it being a groſs ſort of Vegetable. Unleſs you mow it for the Seed, the beſt huſbandry is to graze it, or feed it in Racks; becauſe it is ſo excellent a Food green, and ſhrinks ſo much in the drying. Swine will grow fat with what falls from the Racks. It is not good to let Cattle that are not uſed to this Food, eat too liberally of it at the firſt; for I knew a Yoke of Oxen put hungry into a field of *Clover-graſs*, where they fed ſo heartily on this ſweet Food, that one immediately died through a meer Surfeit, the other with difficulty preſerved; therefore ſome preſcribe to give them a little Straw mixed therewith at the firſt, or to diet them as to the quantity, may do as well. Swine will paſture on it in the fields. *Of paſturing or feeding of Clover-graſs.*

It being preſerved throughly dry, about the middeſt of *March* thraſh it, and cleanſe it from the Straw as much as you can; then beat the Huſk again, being exceeding well dried in the Sun after the firſt Thraſhing, and then get out what Seed you can; or after you have thraſhed it, and chaved it with a fine Rake, and ſunned it in a hot and dry ſeaſon, if you will then rub it, you may get very much out of it; ſome have this way got above two Buſhels out of an Acre: Sir *Richard Weſton* ſaith you may have five Buſhels from an Acre. *Of threſhing or ordering the Seed.*

He is a good Thraſher that can thraſh ſix Gallons in a day, and after the ſecond Thraſhing, drying, and winnowing or chaving, it is confidently averred that it may be purely ſeparated from its Huſk by a Mill, after the manner as Oatmeal is ſeparated from the Chaff, and that at a very eaſie rate: But it is alſo experimented that our own Seed ſown in the Huſk hath proved the beſt, thicker, and certainer than that ſowed of the pure Seed it ſelf, other- *Engliſh Improver.*

wise you must be forced to mix therewith ashes of Wood or Coals coursly sifted, or with Saw-dust, or good Sand, or fine Mould, or any thing else that will help to fill the hand, that you may sowe it evenly and with a full hand. Some have invented new ways of separating the Seed from the Husk.

Of St. Foyn.

The profit thereof. This *St. Foyn*, or *Holy-hay*, hath in several places of *England* obtained the preferrence above *Clover-Grass*, for that it thrives so well, and is so great an Improvement on our barren Lands, where the other will not; it being also natural to our timorous Rusticks not to hazard Land that will yield them any considerable advantage any other way, on any new method of Husbandry; but if they have a Corner of Land that is of little use to them, they will perhaps bestow a little Seed on it, and but few of that minde neither. Then it continues longer in proof than *Clover-Grass*, which wears out in a few years; this continues many, which is a daily provocation to the sloathful to go so near and plain a way, when so long time trodden before his face. In *Wiltshire* in several places there are Presidents of *St. Foyn*, that hath been these twenty years growing on poor Land, and hath so far improved the same, that from a Noble *per* Acre, twenty acres together have been constantly worth thirty shillings *per* Acre, and yet continues in good proof.

On what Land to sowe it. If it be sowen on the poorest and barrenest Land we have, it will thrive, and raise a very considerable Improvement, for on rich Land the Weeds destroy it; besides, it melioratеth and fertilizeth the Land whereon it hath stood for many years, and not barrennizeth it, as is usual with Annual Seeds. You may break it up, and sowe it with Corn till it be out of heart, and then sowe it with *St. Foyn* as formerly: it will thrive on dry and barren Grounds where hardly any thing else will; the roots being great and deep, are not so soon dried by the parching heat of the Sun, as of other Grasses they are.

Quantity of Seed on an Acre, and manner of sowing of it. It must be sowen in far greater quantity than the *Clover*-seed, because the Seed is much larger and lighter. It may be sowen with *Oats* or *Barley*, as the *Clover*: about equal parts with the Grain you sowe it will serve; always remembring you sowe your Grain but thin. Be sure you make your Ground fine for *this* and other *French Seeds*, as you usually do for *Barley*. Fear not the sowing of the Seeds too thick; for being thick they sooner stock the Ground, and destroy all other Grasses and Weeds. Some advise to howe these Seeds in, like Pease in Ranges, though not so far distant, the better to destroy the Weeds between it: this will bear this way of husbandry better than the *Clover*, because that hath but a small Root, and requires to shadow the Ground more than this. Feed it not the first year, because the sweetness thereof will provoke the Cattle to bite too near the Ground, very much to the injury of your *St. Foyn*; but you may mow it with your *Barley* or *Oats*, or if sown by it self, the first year.

Of

Of La Lucerne.

In the next place this Plant *La Lucerne* is commended for an excellent Fodder, and by some preferred before *St. Foyn*, as being very advantageous to dry and barren Grounds. It is managed like the former Seeds: Some write that it requires a moist Ground and rich, others a dry, so that we may conclude it hath proved well on all. The Land must be well dressed, and three times fallowed. *What Ground it requires.*

The time for sowing it, is after the cold weather be over, about the middle of *April*; some *Oats* may be sowen therewith, but in a small proportion: the Seed is very small; therefore the sixth part of it is allotted to an Acre, as is required of any other Grain, one Bushel thereof going as far as six of Corn: It may be mowen twice a year, and fed all the Winter; the Hay must be well dried and housed, for it is otherwise bad to keep. It is good for all kinde of Cattle, but above all, it agreeth best with Horses: it feedeth much more than ordinary Hay, that lean Beasts are suddenly fat with it; it causeth abundance of Milk in Milch-beasts. It must be given at the first with caution, as before we directed concerning the *Clover*, that is mixed with Straw or Hay. You may also feed all sorts of Cattel with it green all the Summer. It is best to mow it but once a year: it will last ten or twelve years. If you desire the Seed when it is ripe, cut off the tops in a dewy morning, and put into sheets for fear of losing the Seed; and when they are dry, thrash them thereon, the remaining stalks may be mowen for Hay. By eating this Grass in the Spring, Horses are purged and made fat in eight or ten days time. One Acre will keep three Horses all the year long. *Hartlibs Legacie.* *Time and manner of sowing of it.* *Its use.*

SECT. V.

Of some other Grasses or Hays.

This is a kinde of *St. Foyn*, and by some judged to be the same. *Esparcet.*

This is a Grain annually sowen in *France* and other Countries, very quick of growth, and excellent food for Cattle, especially for Horses; and after the feeding of it the former part of the Summer, it may be let grow for Hay. It is not so good as *La Lucerne*, because this is annual, the other of long continuance; only this will grow on drier and poorer Land than *Lucerne*, wherein it exceeds it. *La Romeyn, or French Tares or Vetches.*

In the *Low-Countries* they usually sowe it twice in a Summer; the first in *May*: in *June* and *July* it wil be in Flower, and in *August* the Seed is usually ripe. *Spurrey-seed.*

The second time of sowing is after *Rye-harvest*, which Grounds they usually plough up, and sowe it with *Spurrey-seed*, that it may grow up and serve their Kine (after all late Grasses be eaten up) till *New-years-day*. This Pasture makes excellent Butter, preferred

red by many before *May-butter.* Hens will greedily eat the *Herb*, and it makes them lay the more Eggs. *Hartlibs Legacie.*

Trefoyl. *Hop Clover*, *Trefoyl*, or *Three-leaved Graſs* is both finer and sweeter than the great *Clover-graſs*; it will grow in any Ground: it may be sown with Corn (as before) or without, or being sprinkled in Meadows will exceedingly mend the Hay, both in burthen and goodneſs.

Long Graſs in Wiltshire. At *Maddington* in *Wiltshire* about nine miles from *Salisbury*, grows a Graſs in a small Plat of Meadow-ground, which Graſs in some years grows to a prodigious length, sometimes twenty four foot long; but not in height as is usually reported, but creeping on the ground, or at least touching the ground at several of the knots of the Graſs. It is extraordinary sweet, and not so easily propagated as hath been imagined; the length thereof being occasioned by the washing of a declining Sheep-down, that the Rain in a hasty shower brings with it much of the fatneſs of the Sheep-dung over the Meadow; so that in such *Springs* that are not subject to such showers, or at least from some certain Coasts, this Graſs thriveth not so well, the Ground being then no better than another.

Saxifrage. This *Herb* so little esteemed (because not far fetched) is an excellent and proper *Herb* to be nourished or sown in Meadows, for amongst all House-wives it is held for an infallible Rule, That where *Saxifrage* grows, there you shall never have ill Cheese or Butter, especially Cheese; whence it cometh that the *Netherlands* abound much in that Commodity, and only, as is supposed, through the plenty of that Herb.

These and many other most rare and excellent Plants there are, which if they were advanced or propagated that they might openly manifest their worth, might be of much more advantage to the Laborious Husbandmen, than the short, sowre, and naturally wilde and barren Graſs, mixed with a super-aboundant proportion of pernicious Weeds: Therefore it would be very acceptable service to the whole *Nation*, if those that have Land enough would yearly prove some small proportion of these and other *Vegetables*, not yet brought into common use: By which means they would not only advance their own Estates, but the whole *Nation* in general, and gain unto themselves an everlasting Fame and Honor, as did the Families of *Piso*, *Fabius*, *Lentulus*, and *Cicero*, by bringing into use the several Pulses, now called by their Names.

CHAP.

CHAP. IV.

Of Arable Land and Tillage, and of the ſeveral Grains, Pulſes, &c. uſually propagated by the Plough.

IN greateſt eſteem, and moſt worthy of our Care, is the Arable Land, yielding unto the Laborious Huſbandman the moſt neceſſary Suſtentation this Life requires, but not without induſtry and toil: The Plough being the moſt happy Inſtrument that ever was diſcovered; the Inventor of the uſe whereof was by the Heathens celebrated as a Goddeſs.

Prima Ceres ferro mortales vertere terram
Inſtituit. —— Virgil.

But the Plough it ſelf *Triptolemus* is ſaid to have invented. Pliny. This Art was always in eſteem, as before in the Preface we have ſhewn; and from this part thereof, being the moſt principal, doth it take its Name of *Agriculture*, from the Tilling of the Land with the *Plough*, or with the *Spade* the more ancient Inſtrument, though not more neceſſary and beneficial: And ſince its firſt Invention hath there been many ſeveral Improvements made of it, for the more facile and commodious uſe thereof; and every day almoſt, and in every place doth the ingenious *Husbandman* endeavour to excel the ſlothful in this moſt neceſſary Art; that from a burthenſom and toilſom labour, it is in ſome places become but a pleaſing and profitable Exerciſe: and it's hoped that by thoſe Preſidents and Examples, the more Vulgar will be provoked to a more univerſal uſe of that which is beſt and moſt advantageous to themſelves, as well as the publike. More of this Inſtrument ſee hereafter in this Treatiſe.

SECT. I.

What Lands are improved by Tillage.

Non omnis fert omnia tellus. Every ſort of Land almoſt requires a different Huſbandry; ſome Grounds producing plenty of that which on another will not grow. This is none of the meaneſt part of the Huſbandmans ſkill, to underſtand what is moſt proper to be propagated on each ſort of Land: the ſtrong and ſtiff ground receiving the greateſt Improvement from the Plough; and the mellow, warm, and light, from other Plantations of Fruits, *&c.*

Denſa magis Cereri, rariſſima quæque Lyæo. Virgil.

Al-

Although the beſt, warmeſt, and lighteſt Land yields moſt excellent Corn, yet the other ſorts of Lands yield not ſo good Fruits, Plants, Graſs, Hay, *&c.* alſo neceſſary for the Huſbandman: therefore our principal deſigne muſt be to appropriate each ſort to that Method of Huſbandry moſt natural unto it; that where the nature of the Land differs, which it uſually doth in the ſame Parish, and many times in one and the ſame Farm, and ſometimes in the ſame Field, that there may be uſed a different way. We have before diſcourſed of what Lands are fitteſt for *Meadows* and *Paſtures*, and now ſhall give you thoſe Directions I finde, to know what is moſt proper for the *Plough*.

The ſtrong and ſtiff, as we ſaid before, and alſo the cold and moiſt, and that which lies obvious to the extremities of cold or heat, as is moſt of the Champion or Field-land; for there may be ſown ſuch Seeds that naturally affect ſuch places, until they are reduced and better qualified by Encloſure, the firſt and main principle of Improvement: Alſo moſſie and ruſty Grounds are much improved by ploughing; and Grounds ſubject to pernicious Weeds may be much advantaged by deſtroying the Weeds, and propagating good Corn or other Tillage in the room thereof.

The manner of ploughing or husbanding each sort.

Clay, stiff, cold and moist.

All clay, ſtiff, cold, and moiſt Grounds are generally thrice ploughed, in the *Spring*, *Summer*, and at *Seed-time* for Wheat; and four times for Barley, if it be the firſt Grain ſown after long reſting, which in moſt places is not uſual. Theſe ſeveral Ploughings or Fallowings are very advantageous to Ground in ſeveral reſpects.

1. It layeth the Ground by degrees in Ridges in ſuch order as the nature thereof requireth; for the more in number, and the higher the Ridges, the better they are for Wheat, which naturally delighteth in a moiſt Ground, ſo that it be laid dry, that is, not ſubject to be drowned or over-glutted with water in moiſts years. And this Method of laying the Ridges, much prevents the blaſting of Wheat; for Wheat is eaſily overcharged with Water, either in *Winter* or *Summer*.

2. This often ſtirring the Land makes it light, and fitter for the Seed to take root therein; the Clods being apt to diſſolve by being expoſed to the weather, and often broken by the Plough.

3. It kills the weeds which in ſtrong Lands are apt to overrun the Corn.

4. It fertilizeth Land: The *Sun* and the *Sull* are ſome Huſbandmens Soil. *Virgil* alſo ſeems to hint as much, where he ſaith,

Pingue ſolum primis exemplo à menſibus Anni
Fortes invertant Tauri; glebaſque jacentes
Pulverulenta coquat maturis ſolibus æſtas.

5. It defends the Corn much from the extremities of Weather, eſpecially cold Winds: for the more uneven any Piece of Land is, the better it bears the extremities of the Winter; for which reaſon in the open Champion where the Land is dry, and they do

not

not lay up their Ridges as in other places, yet they harrow it but little, and leave it as rough as they can, for no other cauſe but to break the fleeting Winds. The Gardiners near *London* now ſeem to imitate this practiſe, by laying their Gardens in Ridges, not only the better to ſhelter their Seeds from the cold Winds, but alſo to give it an advantage of the Sun, as I my ſelf proved it many years ſince, that Peaſe ſown on the South-ſide of ſmall Beds, ſo raiſed that they ſeemed to reſpond the *Elevation* of the *Pole*, proſpered well, and paſſed the *Winter* better, and were much earlier in the *Spring*, than thoſe otherwiſe planted.

But in caſe you intend to ſowe *Barley* firſt therein, after the third Fallowing, it muſt lie over the *Winter*, that the Froſts may the better temper it for the Seed-time, when it is to be ploughed again: If for Peaſe or Beans, once Fallowing before Winter ſerves the turn.

If it hath a good *Sward* or *Turf* on it, I rather adviſe you to *denſhire* or burn it the Summer before you ſowe it; this is the more expeditious and advantageous way, it ſpends the Acid moiſture (an enemy to Vegetation) it kills the weeds, and brings the Land quickly to a fine light temper.

Other ſorts of Land improveable by the *Plough*, are very good, rich, mixed Land, and of a black mould, *Rich and mellow Land.*

Nigra ſere & pinguis ——— *Optima frumentis* ——— Virgil.

Or of any other colour that hath lain long for Paſture, till it be over-grown with Moſs, Weeds, or ſuch-like, which will as ſoon grow on rich Lands as poor: To theſe Lands *Ploughing* is not only a Medicine or Cure, but raiſeth an immediate Advantage, and much benefiteth the Land for the future; in caſe you take but a Crop or two at a time, and lay it down for Paſture again well ſoyled: or elſe ſown with ſome of the New *Graſſes* or *Hays* before named; but if not, yet only by ſoyling it the year before you lay it down, it may yield a very good Graſs after the Corn is carried off, and ſoon come to a Sward. The Land is to be laid in height according as it is inclinable to Moiſture or Drought. New broken Ground if it be ſowen with Peaſe the firſt year, ſaves one ploughing, and a good part of the Herbage the Summer before; it alſo deſtroys the Weeds, and better prepares the Land for any other Grain.

In every part of *England* there is much Waſte Land, and other old Paſtures that bears the name of Barren Land, although for the moſt part by good Huſbandry it may be reduced into Tillage, and become very fruitful and advantageous to the Huſbandman in particular, and Commonwealth in general: As is evident in many particular parcels lately Encloſed, and taken out of the ſuppoſed barren Heaths and Commons, that are now fruitful Fields; therefore before any thing conſiderable can be effected to the Improvement and right Ordering of theſe ſorts of Land, the Deſigne of *Poor and barren Land.*

Encloſure ought to be ſeriouſly proſecuted; but for ſuch that are already Encloſed, and yet remain barren and unfruitful, it is a manifeſt ſigne of the ill management of the Proprietors, or that the Tenant in poſſeſſion hath but a ſhort time, or that he is obliged not to alter the nature and order of the Ground; or (which is too common) that the preſent charge of good Huſbandry, exceeds an ill Huſbands Store: His poor and beggarly Farm hath waſted what he hath, and he has no more to try new Concluſions withal: And in this condition is abundance of Land in this Kingdom: barren Land, poor Cattle, and bad Corn, do inſenſibly as it were devour us; becauſe once in five or ſeven years in a very wet Summer, or ſuch-like, when the rich Vales ſuffer, theſe barren Lands yield a conſiderable Advantage, which as a Lottery, encourages us to beggery.

The beſt and ſpeedieſt way to reduce theſe Lands that have long lain untilled, and that have a Sward either of ſowre Graſs, or of Ruſhes, Weeds, or ſuch-like, or of heathy Goſs, Fern or Broom; by which means they have contracted an evil Juice, injurious to Vegetation, and withal a fertile Terreſtrial Salt: the beſt way, I ſay, to improve and reduce theſe Lands into Tillage, is to burn, boot, or deuſhire them, as is hereafter ſhewn; which way is uſed on the barrenneſt and pooreſt Lands in *England* or *Wales*, where before hardly any thing would grow, now will grow as good Wheat or other Grain, as on the beſt Land you have. Many Preſidents hereof there are in ſeveral places of *England*, where in two or three years, by this only means the Huſbandman gains as much above all expence, as the purchaſe of the Land was worth before. Obſerve only this Caution, That you be not too greedy to ſowe it ſo often till you have drawn out the heart of the Land, which then it will eaſily yield, that it muſt lie reſted many years, to gain a Swand again; Not that you expend the Soil made of the Straw, on other Lands; which ill Huſbandry is generally uſed, that it brings an ill name on this part of Improvement; which if well ſoyled and laid for Paſture, after two Crops will yield a very good Graſs, as I have ſeen experienced, or elſe may be ſowen with new Hays or Graſſes.

SECT. II.

Of Digging of Land for Corn.

The *Spade* ſeems to contend with the *Plough* for Antiquity; and it is the common Opinion, that it was in uſe before it; the *Spade* being the more plain and ſimple Inſtrument, and withal the laborious. The *Plough* ſeeming to be an *Invention* for expedition, eaſe and advantage, to which generally all *New Inventions* ſhould tend; but that now at laſt the *Spade* ſhould ſupplant the *Plough*, I ſee no reaſon; for as the *one* is neceſſary and uſeful for the better propagating of Plants that take deep root, ſo is the *other* as neceſſary and profitable for ſuch that root more ſhallow, as Corn and Pulſe

uſu-

uſually do: Other differences ſeem to be in the looſening and tempering the ground for the Seeds, the better to extend and ſpread their Roots, and for the better burying and deſtroying the Weeds: Theſe ſeem to be of greater Importance than the depth only; but all theſe by a Judicious and Induſtrious Huſbandman are remedied and performed by the Plough as well as by the Spade: for if the depth of the mould will bear it, or the nature of the Seed you ſowe requires it, a *Double Plough*, the one ſucceeding the other in depth, may be made; or the labour may be performed by two Ploughs, the one following the other in the ſame Furrow; but if a *Plough* be Artificially made, and ſet to work deep, although yon plough the leſs in a day, it will ſtir the Land deep enough for any of our uſual *Grain* or *Pulſe*: And as for breaking or tempering the Land, and deſtroying the Weeds, ploughing and croſs ploughing at ſeveral ſeaſons will do more, and at leſs expence, than once digging can do: And if you pleaſe you may draw over the ſame (before your laſt ploughing) a large kinde of Harrow very heavy, or with a ſufficient weight on it, which in ſome places is uſually called *Dragging*. This extremity is only neceſſary in ſome ſorts of ſtiff Land, other lighter is much more eaſily managed. Mr. *Platt* in his *Adams Tool Revived*; or, *His New Art of Setting Corn*, where he ſo much contends for the *Spade*, gives this inſtance of the *Plough*, *That a parcel of Land firſt croſs ploughed with a deep-cutting Plough, and then ploughed over the third time with a ſhallow Plough, that made very cloſe and narrow Furrows, then was the* Seed *ſown by a* ſkilful Sower, *and then harrowed over, yielded fifteen quarters on each Acre ſo Tilled and Sown.* I preſume if this Relation may upon experience prove true, that none will be ſo much conceited of a Novelty, as to deſert this Method of *Agriculture*, for that tedious and coſtly way of the *Spade*: But in caſe it doth not Annually amount unto ſuch a prodigious increaſe as this *Preſident*, yet doth it plainly evidence that good *Culture* doth infinitely meliorate the Land, and advance the Crop, and manifoldly repay the expence and labour beſtowed thereon; which is the moſt you can expect of the *Spade*.

Deep ploughing as good as digging.

SECT. III.

Of the different Species of Grain, Corn, Pulſe, &c. uſually ſown, or neceſſary to be propagated in our Country-Farm.

There is not any Grain more univerſally uſeful and neceſſary than *Wheat*; whereof there are ſeveral ſorts, ſome more agreeable and better thriving on ſome ſort of Land than on other, that it conduceth much to the Huſbandmans advantage rightly to underſtand the natural temper of his Land, and what Species of *Grain*, and particular ſort of ſuch Grain beſt agreeth with the nature of his Land: As ſome ſorts of Land bear *Pulſes* better than *Corn*, and ſome bear *Barley* better than *Wheat*, and ſome ſorts of Wheat

Wheat.

prove better on cold ſtiff Land, than on hot or dry, &c. We find many ſorts of Wheat mentioned in our *Ruſtick Authors*, as *Whole Straw-wheat*, *Rivet-wheat*, white and red; *Pollard-wheat*, white and red, great and ſmall; *Turkey-wheat*, *Purkey-wheat*, *Gray-wheat*, *Flaxen-weat*: I ſuppoſe the ſame in ſome places called *Lammas-wheat*, *Chiltern*, *Ograve-wheat*, *Saraſins-wheat*, with ſeveral other Names, though it's probable may be the ſame ſorts. The *Great Pollard* they ſay delights beſt on ſtiff Lands, and ſo doth the *Ograve*; *Flaxen-wheat* and *Lammas* on indifferent Land, and *Saraſins-wheat* on any. But what the different natures of theſe and other ſeveral ſorts are, and in what Land they moſt principally delight, and the differences of their *Culture*, I leave to the more ingenious and expert Huſbandman to finde out, and diſcover.

Kinds of Wheat.

It is obſerved that the *Bearded-wheat* ſuffereth not by *Mildew*, becauſe the Beard thereof is a kinde of defence to preſerve it from Dew. *Wheat* is uſually ſown in the *Autumn*, and beſt in a wet ſeaſon; *Triticum luto, hordeum pulvere conſerite:* and either earlier or later, as the nature of the Land, and ſcituation of the place requires.

Barley.

This is another very neceſſary *Grain*, though uſually converted to the worſt uſe of any that grows in *England:* It is the principal Ingredient into our neceſſary Drink moderately uſed, but the uſe thereof in exceſs is become the moſt general raging Vice, and as it were the *Primum Mobile* to moſt other deteſtable Evils. It is alſo a *Bane* to Ingenuity, many of our beſt *Mechanicks* being too much addicted to the tincture of this Grain; nevertheleſs it ſo naturally delights in our meaner ſort of Land, and in the Champion Countries, that it's become a principal part of the *Countrey-mans* Tillage, that the too great a quantity thereof doth impede the propagation of ſeveral other Grains and Pulſes much more neceſſary. Neither know I any way to remedy this Neglect on the one ſide, and Wilfulneſs on the other, unleſs the Deſigne of *Eneloſure* might take effect; for then would the Lands be ſo much the more enriched, that they would bear other Grain, to a greater advantage to the *Husbandman* than Barley; or that a double or treble Tax might be impoſed on every Acre of Barley-land, for what it is on other Grain, which would provoke the *Husbandman* to that which would be moſt for his Advantage; then would there be a greater plenty of all other ſorts of Grain and Pulſe, and at a lower price, and only good Liquor a little the dearer, which may by Houſe-keepers the eaſier be born withal.

The Seaſons for ſowing of *Barley* differ according to the nature of the Soil, and Scituation of the Place: Some ſowe in *March*, ſome in *April*, others not until *May*, yet with good ſucceſs; no certain Rule can be herein preſcribed: it uſually proves as the ſucceeding Weather happens, only a dry time is moſt kindly for the Seed.

Difference of Barley.

There is little difference obſerved in *Barley*, only there is one ſort called *Rath-ripe Barley*, which is uſually ripe two or three weeks before the other, and delights beſt in ſome ſorts of hot and dry Land.

This

This is a Grain generally known, and delighteth in a dry warm Land, and will grow in moſt ſorts of Land, ſo that the Earth be well tempered and looſe; it needeth not ſo rich a Ground, nor ſo much care nor coſt beſtowed thereon, as doth the Wheat; only it muſt be ſowen in a dry time, for rain ſoon drowneth it: they uſually ſay a ſhower of Rain will drown it in the hopper; Wet is ſo great an Enemy to it. It is quick of Growth, ſoon up after it is ſowen, and ſooner in the Ear, uſually in *April*, and alſo ſooner ripe than other Grain; yet in ſome places is it uſual to ſowe *Wheat* and *Rye* mixed, which grow together, and are reaped together; but the *Rye* muſt needs be ripe before the *Wheat*: Neither can I diſcover where a greater advantage lies in ſowing them together, than in ſowing them apart. The principal ſeaſon of ſowing of *Rye* is in the *Autumn* about *September*, according as the ſeaſon permits, and the nature of the Ground requires. *Rye.*

Oats are very profitable and neceſſary Grain, in moſt places of *England*: they are the moſt principal Grain Horſes affect, and commended for that uſe above any other: On ſuch Lands that by reaſon of the cold no other Grain will thrive, yet Oats grow there plentifully, as many places in *Wales* and *Darby-ſhire* can witneſs: there is no ground too rich nor too poor, too hot, nor too cold for them; they are eſteemed a peeler of the Ground; the beſt ſeaſon for ſowing of them is in *February* or *March*. The white Oat is the beſt and heavieſt Grain: The *Meal* makes good Bread, and much uſed for that purpoſe in many places, and alſo good Pottage, and ſeveral other Meſſes, and is in great requeſt towards *Scotland* and in *Wales*: *Oaten Malt* alſo makes good *Beer.* *Oats.*

It is a Grain exceeding advanteous on barren ſandy Lands, it is much ſowen in *Surrey*; much leſs than any other Grain ſowes an Acre: it is uſually ſowen as *Barley*, but later; it is alſo late ripe, and yields a very great increaſe, and is excellent food for Swine, Poultry, *&c.* after it is mowen it muſt lie ſeveral days till the ſtalks be withered before it be houſed: Neither is there any danger of the ſeed falling from it. *Buck-wheat*, or *French-wheat.*

Our Ruſtick Authors mention ſeveral other ſorts of Corn or Grain, as *Xea* or *Spelt-corn*, *Far*, *Millet*, *Seſame*, *Rice*, &c. which I ſhall forbear to particularize on, until we are better ſatisfied of their natures and uſe, and experienced in the way or method of their propagation. *Other ſorts of Grain.*

Of all Pulſes that are ſowen or propagated, Peaſe claim the prehemitence, not only for their general uſe both by Sea and Land, both for man and beaſt, but alſo for the diverſity of their kinds: Almoſt for every ſort of Land and for every ſeaſon a different ſort of Peaſe; ſome are white Peaſe, ſome gray, green, *&c.* not neceſſary here to be enumerated, every underſtanding Husbandman knowing what ſorts beſt accord with his Land. In a ſtiff fertile Ground they yield a very conſiderable Crop, without ſuch frequent Fallowings as other Grains requires, and deſtroy the Weeds, and fit and prepare the Land for After-crops, being *Peaſe.*

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an Improver, and not an Impoveriſher of Land, as Huſbandmen uſually obſerve.

Beans. This alſo is of general uſe and benefit, and placed before any other *Pulſes* by *Pliny*, for its commodiouſneſs both for man and beaſt; yet we finde the Peaſe to be more univerſally propagated. Of *Beans* there are ſeveral ſorts; the *Great Garden-Beans*, and middle ſort of Bean, and the ſmall Bean, or Horſe-bean: The later only is uſually ſowen in *Ploughed Lands*, and delights principally in ſtiff and ſtrong ground, and thrives not in light, ſandy, or barren: They are proper to be ſown in Land at the firſt breaking up, where you intend afterwards to ſowe other Grain, becauſe they deſtroy the Weeds, and improve the Land, as generally doth all other *Cod-ware*. Of the other ſorts of *Beans*, and alſo of *Peaſe*, we ſhall ſay more hereafter in this *Treatiſe*.

Fetches. The *Citch* or *Fetch*, whereof there are ſeveral ſorts; but two of moſt principal Note, the *Winter* and *Summer-Fetch*; the own ſown before *Winter*, and abiding the extremity of the *Weather*; the other not ſo hardy, and ſown in the *Spring*: they are much ſown in ſome places, and to a very conſiderable Advantage: they are a good, ſtrong and nouriſhing food to Cattle, either given in the *Straw* or without, and are propagated after the manner of *Peaſe*.

Lentils. The leaſt of all *Pulſes* is the *Lentil*, in ſome places called *Tills*: They are ſown in ordinary ground, and require it not very rich. Of a very few ſown on an Acre, you ſhall reap an incredible quantity; although they appear on the Ground but ſmall, and lie in a little room in the Cart: they are a moſt excellent ſweet Fodder, and to be preferred before any other Fodder or Pulſe for Calves, or any other young Cattle.

Lupines. This *Pulſe*, though not uſed in this Country as ever I could underſtand (unleſs a few in a Garden) yet we finde them highly commended to be a *Pulſe* requiring little trouble, and to help the Ground the moſt of any thing that is ſown, and to be a good manure for barren Land, where it thrives very well, as on ſandy, gravelly, and the worſt that may be, yea, amongſt Buſhes and Bryars. Sodden in water they are excellent Food for Oxen, and doubtleſs for Swine and other Cattle. If this be true, as probably it ſeems to be, I admire this Plant ſhould be ſo much neglected; but I may give you a more plenary and ſatisfactory Accompt of this and ſome other not uſual Seeds and Pulſes another time.

Tares. Theſe are not uſual in moſt places of *England*; but where they are ſown they much benefit the Land as other *Pulſes*, and are rather to be preferred for Fodder than any other uſe they can be put unto.

Other Pulſes. There are ſeveral other *Pulſes* or *Seeds* mentioned in our Authors, as *Faſels*, *Cich Peaſon*, *Wilde Tares*, &c. which if carefully and ingeniouſly proſecuted might redound to the Huſbandmans Advantage; and in the ſame manner might ſeveral other not yet brought into common uſe, although they might in all probability be as beneficial as thoſe already in uſe.

SECT.

SECT. IV.

Of Hemp and Flax.

Within the compaſs of our Lands ſubject to the *Culture* of the Plough, may theſe two neceſſary and profitable Vegetables be propagated; requiring a competent proportion of Ground to raiſe a quantity ſufficient to ſupply our ordinary occaſions and neceſſities; in defect whereof, and meerly through our own neglect and ſloath, we purchaſe the greateſt ſhare of theſe *Hempen* and *Flaxen* Commodities we uſe from Strangers at a dear Rate, when we have room enough to raiſe wherewith of the ſame Commodities to furniſh them: But that (to our ſhame be it ſpoken) we prefer good Liquor, or at leaſt the *Corn* that makes it, before any other Grain or Seed, although other may be propagated with greater facility, leſs hazard, and abundantly more advantageous, both to the Huſbandman and Nation in general, than that.

Impediments to the ſowing of Hemp and Flax.

I need not put Excuſes into the Countrey-mens mouths, they have enough for their grand Negligence in this principal part of *Agriculture*; but that I here propoſe them in hopes ſome *Worthy Patriots* will uſe their endeavours to remove theſe Impediments.

Want of Trade an Impediment.

1. The firſt and moſt grand Impediment to this Improvement, is want of Encouragement to Trade, or a right Conſtitution or Ordering of Employments for the Poor throughout the Countries, which may be accompliſhed without charge (the common *Remora* to all Ingenuities) by granting ſome extraordinary *Immunities* to certain Societies in ſeveral places convenient in every County to be eſtabliſhed; which being the firſt and chiefeſt thing to be done, will almoſt of it ſelf remove all other Impediments.

Want of Experience an Impediment.

2. The next is the defect of Experience; very few underſtanding the way of Sowing, Gathering, Watering, Heckling, and other particular Modes in ordering theſe Commodities, nor yet the nature of the Ground either of them delights in: All which by the Preſident and Example of ſome publique and ingenious Spirits, and by the conſtitution of a Trade to take off the ſaid Commodities to the Huſbandmans Advantage, may eaſily be removed.

Tythes an Impediment.

3. Another main Impediment to the Improvement and Propagation of theſe and ſeveral other Staple-Commodities, not yet brought into publike uſe and practice, is, that the Planter after he hath been at extraordinary Expence in Fertilizing, Tilling, and Planting his Land, and in preſerving and advancing the Growth of ſuch Commodities, not only the Profit of his Land, but alſo of all his Expence and Labour muſt be *decimated*; which in ſome years amounts to more than his own clear Profits; when before ſuch Improvements made, little Tythe was paid, as for Paſture-Lands is uſual; either a reſervation to the *Parſon* of what was formerly paid out of ſuch unimproved Lands, or a certain *Modus decimandi*,

cimandi, according to the nature of the Commodity planted, might prove a very great Encouragement to the Husbandman, an infinite Advantage to the Nation in general, and not the least injury or loss to the *Clergy* or Impropriator. Some other Impediments there are, and also other Propositions might be made for the Advancement of this and several other Commodities, but they require more time to treat of, than in this place we may dispense withal.

Hemp. *Hemp* delights in the best Land, warm and sandy, or a little gravelly, so it be rich and of a deep Soil; cold Clay, wet and moorish is not good: It is good to destroy Weeds on any Land. The best *Seed* is the brightest, that will retain its colour and substance in Rubbing: three Bushels will sowe an Acre; the richer the Land, the thicker it must be sown; the poorer, the thinner: from the beginning to the end of *April* is the time of sowing, according as the Spring falls out earlier or later; it must be carefully preserved from Birds, who will destroy many of the Seeds.

The Season of Gathering of it is first about *Lammas*, when a good part of it will be ripe, that is the lighter Summer-hemp that bears no Seed, and is called the *Fimble-hemp*, and the Stalk grows white; and when it is ripe it is most easily discernable, which is about that season to be pulled forth and dried, and laid up for use; you must be cautious of breaking what you leave, lest you spoil it: you must let the other grow till the Seed be ripe, which will be about *Michaelmas*, or before; and this is usually called the *Karle-Hemp*. When you have gathered and bound it up in bundles, in Bonds of a yard compass (the Statute-measure) you must stack it up, or house it till you thrash out the Seed. An *Value of Hemp.* Acre of *Hemp* may be worth unwrought from five to eight pound; if wrought up, to ten or twelve pound or more; and is a very great succour to the poor, the *Hempen Harvest* coming after other Harvests: And then in the bad, wet, and Winter-seasons it affords continual employment to such also that are not capable of better.

But for the Method and right way of *Watering*, *Pilling*, *Breaking*, *Tewtawing*, &c. I shall leave you to such that are experienced therein, finding no certain Rules left us by our Rustick Authors.

Flax. This is also a very excellent Commodity, and the Tilling and Ordering thereof a very good piece of Husbandry; it will thrive in any good sound Land be it in what Country soever, but that is best that hath layen long unploughed: the best Land yields the best *Flax*, and raises the greatest Improvement. The Land must be well ploughed, and laid flat and even, and the Seed sown in a warm season, about the middle or end of *March*, or at fartheſt in the beginning of *April*. If it should come a wet season, it would require weeding.

Best Seed. The best Seed is that which comes from the *East Countrey*, although it cost dear, yet it will easily repay the Charge, and will last indifferent well two or three Crops, then it's best to renew it again:

again: Of the beſt Seed two Buſhels may ſerve on an Acre, but more of our *Engliſh Seed*, becauſe it groweth ſmaller. You muſt be ſure to ſowe it on good Land, becauſe it robs the ground much and burneth it, as anciently it was obſerved by *Virgil*, *Urit enim lini Campum ſeges*, but it liberally repayeth it.

You muſt be careful that it grow not till it be over-ripe, nor to gather it before it be ripe; the ripeneſs is beſt known by the *Seed*; at the time let the Pluckers be nimble, and tie it up in handfulls, and ſet them up until they be perfectly dry, and then houſe it.

An Acre of good *Flax* on the Ground may be worth, if it be of the beſt Seed, from ſeven to twelve pound, yea far more; but if it be wrought up fit to ſell in the Market, it may come to fifteen or twenty pound. *Value of Flax.*

As for the Watering, Drying, Breaking, and Tewtawing, as we ſaid before of *Hemp*, we muſt refer to thoſe that are better experienced therein.

SECT. V.

Of Woad, &c.

This is a very rich Commodity, and worthy to be taken notice of by the *Husbandman*; it requires a very rich Land, ſound and warm, ſaith Mr. *Blith*: But I have ſeen it uſually planted upon an ordinary Ground, but warm and light, and in good heart, having long reſted, and but new broken up: it robs Land much, being long continued upon it; yet moderately uſed, it prepares Land for *Corn*, abating the overmuch Fertility thereof, and draws a different Juyce for what the *Corn* requires: the Land muſt be finely ploughed and harrowed for this Seed, whereof about four Buſhels will ſowe an Acre; it muſt be finely harrowed, and all Clots, Stones, Turfs, *&c.* picked away and laid on heaps, as is uſual in *Woad-Lands*, then it is to be continually weeded till the Leaves cover the Ground; and when the Leaves are grown fair and large, then ſet to cutting, and ſo throughout the Summer, that you may have five or ſix Crops, and ſometimes but three in one year of *Woad*: what grows in Winter, Sheep will eat.

The time for ſowing of *Woad* is in the middle and end of *March.*

When it is cut, it muſt be immediately carried to the *Mill.* The manner whereof, with the right ordering of *Woad*, and of all other neceſſary circumſtances relating thereto, is beſt learned of an experienced *Workman*, which is eaſily obtained.

To take it in the very ſeaſon is a fundamental Piece, which is when the Leaf is come to its full growth, and retains its perfect colour and lively greenneſs; then ſpeedily cut it, that it fade not, nor wax pale before you have cut your Crop. *To know when it is full ripe.*

The two firſt Crops are the beſt, which are uſually mixed together in the ſeaſoning; the later Crops are much worſe, which if either

either are mixed with the former, they mar the whole.

Profit of Woad. It is a Staple Commodity for the *Dyers* Trade, and is very advantageous to the *Husbandman*; it more than doubleth the Rent of his Land, sometimes it quadruples it: it hath been sold from 6 *l.* to 30 *l.* the Tun.

Rape and Cole-Seed. The planting and propagating whereof is esteemed another excellent piece of Husbandry and Improvement for Land, and more especially on *Marsh-Land*, *Fen-Land*, or newly recovered *Sea-lands*, or any Land rank and fat, whether Arable or Pasture.

The *Cole-Seed* is esteemed the best, the biggest and fairest also that you can get: let it be dry and of a clear colour, like the best *Onyon-Seed*; it is usually brought from *Holland*.

It is to be sown at or about *Mid-summer*: you must have your Land ploughed very well, and laid even and fine, and then sowe it; about a Gallon will sowe an Acre: the Seed must be mixed with some other matter, as before we directed about *Clover-Grass Seed*, for the more even dispersing thereof.

When the one half of the Seed begins to look brown, it's time to reap it, which must be done as you usually do Wheat, and lay it two or three handfuls together till it be dry, and that throughdry too, which will be near a fortnight ere it be dry enough; it must not be turned nor touched, if it be possible, lest you shed the *Seed*: it must be gathered on *Sheets*, or large *Sayl-clothes*, and so carried into the *Barn* or *Floor* very large, to be immediately thrashed out.

Profit thereof. The main Benefit is in the Seed: If it be good, it will bear five quarters on an Acre, and is worth usually four shillings the Bushel, sometimes more and sometimes less; the greater your parcel is, the better price you will have. It is used to make *Oyl* thereof; it thrives best on moist Land, it cannot be too rank; it fits the Land for Corn, *&c.* Thus far hath Mr. *Blith* delivered; little else is written of this Seed, therefore we leave it to the more experienced persons.

Turneps. Although this be a Plant usually nourisht in Gardens, and be properly a Garden-Plant, yet it is to the very great Advantage of the *Husbandman* sown in his Fields in several forein places, and also in some parts of *England*, not only for *Culinary* uses, as about *London* and other great Towns and Cities, but also for Food for Cattle, as *Cows*, *Swine*, &c. They delight in a warm, mellow, and light Land, rather sandy than otherwise, not coveting a rich Mould. The Ground must be finely ploughed and harrowed, and then the Seed sown, and raked in with a Bush, or such-like. They are sown at two Seasons of the year; in the Spring with other the like *Kitchin-Tillage*, and also about *Midsummer*, or after, in the Fields for the use of Cattle, or any other use. In *Holland* they slice their Turneps with their tops, and Rape-seed Cakes, and Grains, *&c.* and therewith make Mashes for the *Cows*, and give it them warm, which the *Cows* will eat like *Hogs*.

Harlib's Legacie.

Cows and *Swine* also will eat them raw, if they are introduced

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into the dyet, by giving the *Turneps* firſt boyled unto them, and then only ſcalded, and afterwards they will eat them raw.

It is alſo reported, that at *Rouen* they boyl *Turneps* with the Leaves on them till they be tender, and add thereto Wheaten-bran, and of the Cakes of *Rape-ſeed* or *Lin-ſeed*, all which hath a ſingular faculty of fatting Cattle (but for Milch-beaſts they put leſs of the Seeds:) this they give twice a day, and is the moſt part of their Feeding for the *Winter* only.

It is a very great neglect and deficiencie in our Engliſh Huſbandry, that this particular Piece is no more proſecuted, ſeeing that the Land it requires need not be very rich, and that they may be ſown as a ſecond Crop alſo, eſpecially after early-Peaſe; and that it ſupplies the great want of Fodder that is uſual in the Winter, not only for fatting Beaſts, Swine, *&c.* but alſo for our *Milch-Kine.*

SECT. VI.

Of Setting of Corn.

Beſides the uſual manner of ſowing of Corn, are there ſeveral other ways of diſperſing it, as by ſetting, and howing of it in, *&c.* This Art of ſetting Corn ſeems to be very Ancient, as appears by *Virgil*, *Unguibus infodiunt & ipſis fruges* —— and hath been a long time attempted to be brought into practice again, as appears by Mr. *Platt's Adams Tool Revived*, Printed in the year 1600. where he doth very ingeniouſly deſcribe not only the way, but the great advantage that accrews by this then new Diſcovery: The firſt part thereof giving you the reaſon why Corn ſown in the common way yields not ſo great an increaſe as it doth by being ſet; then he ſhews you the manner of digging the Land where you are to ſet your Corn (whereof we have ſpoken before) then he proceeds to the Deſcription of his Inſtruments, whereof ſome are only many pins ſet at a convenient diſtance in a Board, which compreſſed on the Earth make ſo many holes wherein the *Wheat-grains* are to be dropt one by one: but becauſe theſe are very unneceſſary and troubleſome, and that there are newer and better ways found out, I ſhall decline any further diſcourſe about them. Alſo he gives you the diſtance and depth; where he obſerves, that at three Inches diſtance and three Inches depth there hath grown thirty Quarters of Wheat on an Acre of Ground, and that four Inches in depth and diſtance hath yielded but twenty Quarters: he alſo ſpeaks of five Inches in depth, aud five in diſtance: It's probable the diverſity of the Land, or of theſe years wherein the experiments were proved, might beget ſome differences. Afterwards he adviſeth in barren Lands to fill up the holes with ſome good mixture or fat Compoſt, or to imbibe the Grain you ſet therewith; whereof more hereafter.

Discovery of infinite Treasure.

Then Mr. *Gabriel Platt* succeeds with his newer and better composed Method of setting Corn, whereby he pretends to remedy all the Inconveniences of the former way, by his two new invented Engines, the one for the more expeditious setting of the Corn, the other for the laying up the Land on Ridges, just on the tops of the rows of Corn, that neither surplusage of moisture might annoy it, nor frost in Winter kill it; which way prevents the laying the Land in high Ridges before sowing: Neither need the Land be digged, only ploughed, harrowed, and then set.

Description of Mr. Platts Engine for setting Corn.

The description of which *Engine* for the setting of Corn he gives you in these words: "Let there be two boards of equal "breadth boared with wide holes at four inches distance, and "be set in a Frame of two Foot high, the one from the other; "then let there be a Funnel for every hole made of thin boards, a-"bout two Inches square: Then for the top let there be two thin "boards of equal breadth boared likewise, whereof the upper-"most is to be boared with an hot Iron, with holes longer the "one way than the other, and is to be of such a thickness, that "but one Corn only can lie in the hole: The other board is to be "boared with wide holes, and to be loose, that while the En-"gine is charged, the holey part may be under the holes of the up-"permost board; and when the holes in the Earth are made by "the Nether-works, then to be moved, so that all the Corns may "drop down.

"And for charging, a little Corn being swept up and down by "a Broom or a Brush, will fill the holes; and if any miss, the "workman may put in here and there an odd Corn with his fin-"gers, and then moving the second Board till the holes be an-"swerable, all the Corns will drop down at an instant; then let "a large ledge be set about the top of the Engine to keep the "Corn from spilling; and so is the upper-part thereof made: "And as for the Nether-work, it is somewhat more chargeable "and intricate; for there must be for every hole a little socket "of brass, cast with a Verge to nail unto the Nether-board about "the hole, which must be turned, and boared all of one wideness "to an hairs-breadth, and must be wide above, and streight be-"low like a Faucet: Then there must be Iron pins of five inches "long, of great thick Iron-wyer, drawn so fit, that no earth can "come into the brass-sockets. Now to make these play up and "down at pleasure, is the greatest skill in the whole work, and "there is no other way but that which is here described. There "must be for every wooden Funnel a piece of Iron forged flat "with a hole in the middle, edge-wise, which through two slits "in the nether-part, must play up and down, through which a "brass-nail must be fastned, cast with an head, contrary to other "nails, bowing downwards, to which the Iron-pins must be fast-"ned with wyers, and so thrust down and plucked up at pleasure; "And then every end of the flat pieces of Iron must be fastned "into a piece of Wood, of such thickness, that two thereof may

"fill

" fill up the diſtance between the rows of the wooden Funnels.
" Theſe may be made to play up and down like Virginal-Jacks;
" and when they are lifted up, then the braſs Funnels being wi-
" der above than below, give leave for the Corn to fall into the
" holes all at an inſtant. Theſe Jacks muſt be faſtned together,
" the two firſt on either ſide of the wooden Funnels, then ſo ma-
" ny together as the weight of the workmen is able to thruſt down
" to make the holes: And there muſt be a ſtay to hold up the
" Jacks at pleaſure when they are lifted up again to ſuch an al-
" titude, as that the Corns may deſcend by them into the holes:
" And the bottom of the Iron-pins muſt be flat, and by that
" means they will not be ſo apt to draw up the Earth into the
" Funnels; alſo the roots of the Corn will ſpread better, and
" bring a greater increaſe, if the ground be ſadned a little in the
" bottom of every hole: And the tops of the Iron-pins muſt like-
" wiſe be flat, and hang a little looſe in the wyers; elſe if any of
" the braſs-ſockets get a little wrench, they will not be drawn
" through, becauſe the holes muſt be ſtreight. Though the ma-
" king of this Engine be ſomewhat chargeable and troubleſom,
" *yet* if ſkilful men firſt break the Ice, then it will be common, and
" the moſt profitable Invention that ever was found out: and the
" top of the Engine muſt be ledged about with large ledges to
" to keep the Corn from ſpilling; ſo will a quart or two of Corn
" ſerve a good while, and muſt be renewed upon occaſion. Alſo
" if the ſlits in the Funnels be lined with Iron, the work will be
" more durable.

" But leſt the charge of this Engine, together with the diffi- *The ſecond Engine.*
" culty of getting it, may be a hinderance to the work intended,
" *our Author* adds a deſcription of a more eaſie way (*as he ſuppo-*
" *ſeth*) for the poorer ſort, which is ſubject to the capacity of e-
" very ordinary workman, and is made of Wood only without
" either Braſs or Iron. But he further tells you, theſe Engines
" will not endure like the other; beſides, there muſt be four
" workmen, becauſe the Engine muſt be made of two parts, the
" one to go before and make the holes, and the other to come af-
" ter and drop in the Corn. This laſt muſt not differ a whit from
" the upper-part of the former, only it muſt have four feet like
" tops, in the four corners, which muſt be ſet right in the holes,
" which are made by the other part which goeth before, which
" likewiſe muſt have four ſuch feet to leave an impreſſion when
" it is removed forward, whereby the ſecond may be rightly pla-
" ced, ſo that the Corns or Grains may fall right into every hole.
" That part which muſt make the holes is to be made of two * *The reaſon whereof, is I ſuppoſe, that the lower board ſhould be kept down whileſt the pins be drawn out of the earth, that the earth fall not into the holes.*
" boards of equal breadth to the other, and muſt be boared full of
" holes, of equal diſtance likewiſe; the wooden pins muſt be
" greater than thoſe of Iron, becauſe the holes will need to be
" ſomewhat large and wide, and they muſt be faſt in the upper-
" board, and looſe in the nether-board.

" * And if the Engine be large, as this way it may be larger than
" the other, by reaſon that it is eaſilier lifted and removed, be-
" ing

" ing in two parts, then the upper-part must be slit, and divided " into so many parts, that the weight of the workmen by tread- " ing upon them, may press them down to make the holes: and " though this way will require four workmen, yet the charge " will not be double, nor much more than the former way, by " reason that the workmen may go forward with more expedi- " tion, and may set a broader compass of Ground at one " time.

Thus far hath Mr. *Gabriel Platt* proceeded in his description of his Instruments, which are the most accurate and ingenious that we find publish'd. I have given it you *verbatim*, lest any mistake might be imputed to the *Relator*. To ingenious men it is plain enough, but to others this and every thing else besides the plain *Dunstable-road* is intricate. *Capiat qui capere potest.* Let such make use of it that are willing to promote *Ingenuity*: it's probable it may succeed, according to his designe, and your expectation; if not, by the Errors of these and such-like, you may discover some better and more facile way to accomplish this Enterprise: *Facile est addere Inventis.* Let not a few Errors or mistakes, or bad success, discourage any man in a designe of so great and publike concernment, and experimented at so easie an expence.

Errors in these Engines.

But lest any should be over-confident in these Engines, and spend much time and some cost on their preparation, and not immediately find them to respond to his expectation, which might beget a Prejudice not only against this, but all other ways esteemed Novel (for such that are over-earnest to accomplish any designe, in case it succeed not, are sooner prejudiced against it than those that undertake it with more Caution) I shall discover such Inconveniences and Errors that you may probably meet with-al in this way Mr. *Platt* describes.

1. Men, not Children nor Women are capable of this Employment, that it will be very difficult to procure Setters for any great quantity, the work being so tedious, and so many required to perform it: Such Inventions being to be preferred, that are most universal, most easie, and performed in less time and with less expence.

2. In hard, stiff, clay-ground, or any other after rain, holes will be very troublesome to make; the pins going down-right, and rising perpendicularly again, will bring up much of the Earth with them, that it will be an intolerable trouble to keep the pins clean, and the holes open.

3. In stony Land, or where roots of trees, *&c.* annoy the ground, this Engine will be useless; for if one straw hinder one pin, the rest cannot enter.

4. The pins must be very thick and near together, else if any of the Corn be injured by worms, frost, *&c.* your Crop will be defective.

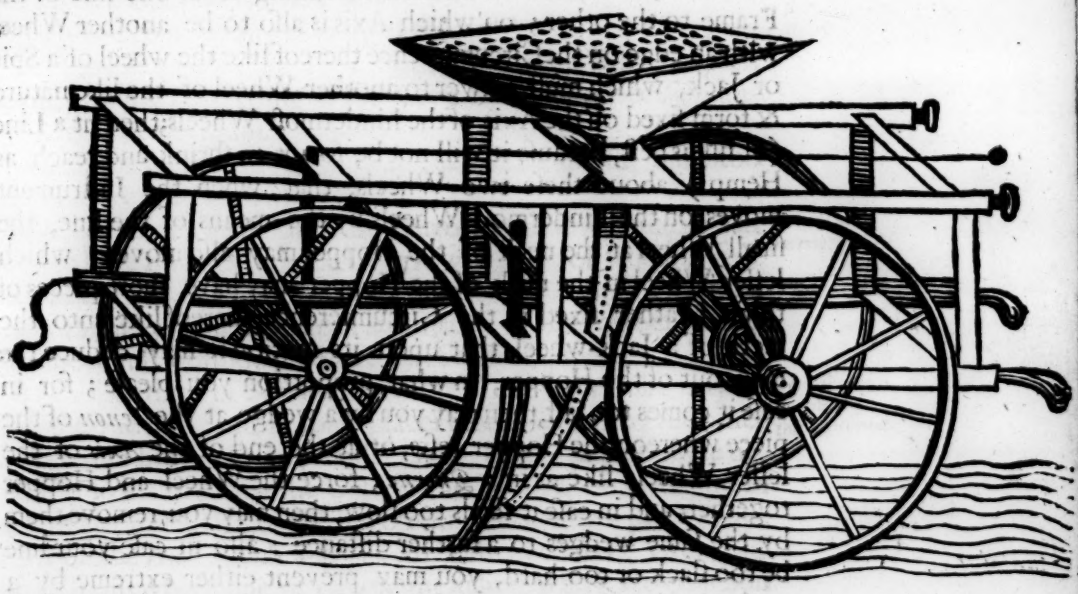
Howing in of Corn commended.

All which Inconveniences and Errors are remedied and prevented by howing in of Corn by hand in rows, both for the saving of Corn, and conveniencie of weeding, and for the better encrease at the harvest, far beyond what can be expected the com-

common way : Alſo it is of much leſs expence than the ſetting Engine. Hartlib's *Legacie.*

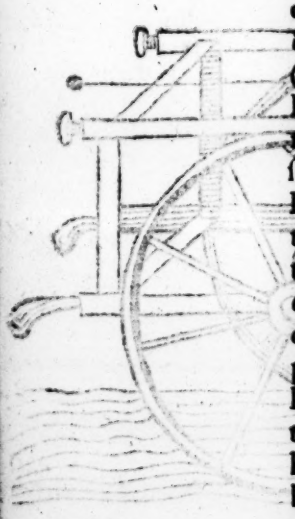
Theſe ſeveral ways are all that we find as yet diſcovered, and theſe alſo for what I can underſtand but little practiſed, at leaſt for Corn ; but for Peaſe it is uſual, eſpecially the better ſort of Peaſe, to be howed in as Mr. *Hartlib* preſcribes, and that to a very conſiderable advantage : Alſo I have cauſed the beſt ſort of Peaſe to be ſet as Beans in double rows at a good diſtance, with admirable ſucceſs. The ſame Method is uſed at this day about *Godalming* in *Surrey*.

But to remedy and remove all manner of Errors or Inconveniences that can be found in ſetting or howing in of Corn, I ſhall here give you a plain and perfect deſcription of an eaſie and feaſible Inſtrument that ſhall diſperſe your Corn, Grain, or Pulſe, of what kinde ſoever, at what diſtance and in what proportion you pleaſe to deſigne, and that with very great expedition, and very little extraordinary charge, expence, or hazard.



Firſt, Make a Frame of Timber of about two or three Inches ſquare, the breadth of the Frame about two foot, the height about eighteen inches, the length about four foot, more or leſs as you pleaſe ; place this Frame on two pair of ordinary Wheels like Plough-wheels. The Axletree of the two foremoſt Wheels is to lock to either ſide as doth the fore Axletree of a Waggon, for reaſons hereafter ſhewn ; the hindermoſt Axeltree being of Iron, and ſquare in the middle, muſt be fixed to the Centre of the Wheels, that the Axes and Wheels may move together : Then about the middle of the Frame in the bottom let there be fixed an Iron-Inſtrument, or of Wood pointed with Iron, like unto a Coulter, made a little ſpreading at the bottom in the nature of a Share, made to paſs through two Mortoiſes on the top for its greater ſtrength, and made alſo to be wedged higher or lower accor-

cording as you will have your furrow in depth; the uſe whereof is only to make the furrow ſo that you muſt make the point thereof of breadth only to move the Earth, and caſt it or force it on either ſide, that the *Corn* may fall to the bottom of the furrow; then over this *Share* or *Coulter*, a little behinde it may a Wooden-pipe be made to come from the top of the Frame to the lower end of the *Share*, tapering downwards, and as near as you can to the *Share*, to deliver the *Corn* immediately as the ground is opened, and before any Earth falls in, that what Earth doth afterwards fall in, it may fall on the *Corn*. This Pipe is to proceed out of a large Hopper fixed on the top of the Frame, that may contain about a Buſhel more or leſs, as you think fit; but that the *Corn* may gradually deſcend, according to the quantity you intend to beſtow on an Acre, at the very neck of the Hopper, underneath in the ſquare hollows thereof, muſt be fitted in the edge of a Wheel of Wood, about half an Inch thick, and proportionable to the cavity of the neck; the Wheel need not be above two or three Inches Diameter, and fixed on an Axis extending from one ſide of the Frame to the other; on which Axis is alſo to be another Wheel with an edge on the Circumference thereof like the wheel of a Spit or Jack, which muſt anſwer to another Wheel of the like nature & form fixed on the Axis of the hindermoſt Wheels; then fit a Line (of ſilk is beſt, becauſe it will not be ſo apt to ſhrink and reach as Hemp) about theſe two Wheels, that when the Inſtrument moves on the hindermoſt Wheels by the means of the line, the ſmall Wheel at the neck of the Hopper may alſo move; which leſſer Wheel in the neck of the Hopper may have ſhort pieces of thick Leather fixed in the Circumference thereof like unto the teeth of a Jack-wheel, that upon its motion it may deduce the *Corn* out of the Hopper, in what proportion you pleaſe; for in caſe it comes too faſt, then may you by a wedge at the *Tenon* of the piece whereon the Hopper reſts, or at the end of the *Axis* of the leſſer Wheel, like as in a *Querne*, force the Wheel and Hopper together; and in caſe it feeds too ſlow, then may you remove them by the ſame wedges to a further diſtance: alſo in caſe your line be too ſlack or too hard, you may prevent either extreme by a wedge in the place where the Axis of the wheels moves, or by a third Wheel about the middle of the line made to move further or nearer as you ſee cauſe.



The more particular uſe and benefit of this Inſtrument.

One Horſe and one Man may work with this Inſtrument, and ſowe Land as faſt or faſter than ſix Horſes can Plough, ſo that you may with eaſe compute the expence, in caſe your Inſtrument be ſingle; but you may in the ſame Frame have two Shares at twelve inches diſtance more or leſs, as you will have the rows of *Corn* diſtant the one from the other; and two Pipes out of the ſame Hopper, and two ſmall Wheels on the ſame Axis, with other Wheels anſwerable, every whit as eaſie to be performed as one, and then may you double your proportion of Land in a day.

1 *As to time.*

2. *Equality of Seed.*

This Inſtrument will always keep the ſame proportion you firſt ſet him to, which you muſt thus contrive: Firſt know the length

of

of the Furrow you ſowe, then caſt up how many of theſe Furrows at ſuch diſtance your Inſtrument is made for (whether a foot more or leſs) will amount unto an Acre; then conclude how much to ſowe on an Acre; as ſuppoſe a Buſhel, then divide that Buſhel into ſo many parts as you have furrows or diſtances in that Acre: then take one or two of thoſe parts, and put into your Hopper, and obſerve whether it will hold out or ſuper-abound at the end of one or two Furrows, and accordingly proceed and rectifie the Feeder; or you may judge by your own reaſon, whether it feed too faſt or too ſlow.

In caſe it feeds too faſt, notwithſtanding they be cloſe placed together, then you may make that Wheel at the lower Axis, wherein the Line moves, to be leſs than the upper, then will the motion be ſlower: And thus may you make it move as ſlow as you will, by augmenting the upper, and diminiſhing the lower Wheels wherein the Line is, and make it move faſter by the contrary Rule. 3 *Rectification of the Feeder.*

In caſe you drive apace, it feeds apace; in caſe you drive but ſlow, it feeds but ſlowly: here is no error. 4 *No difference in driving faſt or ſlow.*

When you come to any turning at the Lands-end, by lifting up the hindermoſt part of the Inſtrument, that thoſe Wheels touch not the ground, the feeding of the Corn immediately ceaſeth until you ſet it down again. 5 *No loſs of Seed.*

Alſo all the Corn you ſowe lies at one certain depth, none too deep, nor any too ſhallow.

You may place a ſmall kinde of Harrow to follow, but the beſt way is to have on each ſide each Furrow a piece of wood a little broad at the end, ſet aſlope to force the Earth rounding on the Corn; this may well be placed and fitted to the bottom of this Inſtrument juſt behinde the Share and Feeding-pipe. 6 *Needs no harrowing.*

By this Method of Sowing, any ſort of Grain or Pulſe may be ſaved the one half, and in ſome places more, which by the other way is either buried ſo deep under Clots, that it cannot come up, or elſe is ſo ſhallow that the Cold in the Winter, or Drought in the Summer killeth it, or elſe lies on the Surface as a prey to the Fowls of the Air: Much alſo thereof falls in cluſters, twenty or thirty Grains where one or two might ſuffice, which are common Inconveniences, and uſually happening to the vulgar way of ſowing *Corn*, the greater half by far is loſt, which in all probability may be ſaved by the uſe of this very Inſtrument, which will doubly requite the extraordinary charge and trouble thereof; for here is no *Corn* ſowed under Clots but in Rows, as the Earth is ſtirred and moved: it is all at one certain depth, and at one certain diſtance, and equally covered, below the injury of Froſt, and Heat, and Rapine of Birds. Alſo by this way the *Corn* may be ſown in the very middle or convenient depth of the mould, that it may have the ſtrength of the Land both below and above the Root, which in the other more uſual way the *Corn* falls to the bottom of the Furrow on the Gravel, Clay, or ſuch-like hard Ground, that it ſeldom thrives ſo well as what happens to be in *General Advantages of this Inſtrument.*

the midſt. This *way* alſo exceeds the way of *Setting Corn*, where the Pins thruſt into the Ground hardens and faſtens the mould, that unleſs the Land be very light, it confines the Roots to too narrow a place, which in this way is prevented, as I have lately obſerved in Garden-beans, that thoſe howed in, prove better than thoſe ſet with a ſtick.

By the uſe of this Inſtrument alſo may you cover your Grain or Pulſe with any rich Compoſt you ſhall prepare for that purpoſe, either with Pigeon-dung dry or granulated, or any other Saline or Lixivial Subſtance, made diſperſeable, which may drop after the *Corn*, and prove an excellent Improvement; for we finde experimentally that Pigeons-dung ſown by the hand on Wheat or Barley mightily advantageth it by the common way of Huſbandry; much more then might we expect this way, where the dung or ſuch-like ſubſtance is all in the ſame Furrow with the *Corn*, where the other vulgar way a great part thereof comes not near it.

It may either be done by having another Hopper on the ſame *Frame* behind that for the *Corn*, wherein the Compoſt may be put and made to drop ſucceſſively after the *Corn*; or it may be ſown by another Inſtrument to follow the former, which is the better way, and may both diſperſe the Soil, and cover both Soil and Seed.

The *Corn* alſo thus ſown in Ranges you may with much more conveniencie go between, and either weed it or howe it, and earth it up as you think good, and at Harveſt will eaſily repay the Charges.

Alſo the Fore-wheels being made to lock to and fro on either ſide, you may have an upright Iron-pin fixed to the middle of the *Axis* extended to the top of the Frame; and from thence a ſmall Rod of Iron to come to your hand, with a crooked neck juſt againſt the neck of the Hopper; by means of which Iron-rod you may lock or turn the Wheels either way, and guide your Inſtrument, and rectifie it, if it deviate out of its right courſe.

The Hopper muſt be broad and ſhallow, that the Seed preſs not much harder when it is full, than when it is near empty, leſt it ſowe not proportionably.

This Inſtrument, although it may at the firſt ſeem myſterious and intricate to the ignorant, yet I am very confident it will anſwer to every particular of what I have written of it; and any ingenious Wheel-wright, Joyner or Carpenter may eaſily make the ſame with very little Inſtruction, and any ordinary Plough-man may uſe it.

Another excellent Advantage of this Inſtrument.

If your Land be either near the Water, or Clay, or Sand, Rock, Gravel, *&c.* it is not then convenient to ſowe the *Corn* within the Land, becauſe it may not have depth for rooting: By this Inſtrument may you then by placing the *Share* near the top of the Land, only to remove as it were the Clots, *&c.* drop your Seed in rows, and by certain *Pins* or pieces of Wood or Iron, made flat at the end, and a little ſloping, ſet on each ſide ſuch Rows of Corn or Grain,

Grain, the *Earth* may be caſt over it and laid in Ridges above the ordinary level of the Land; which way I have proved to be very advantageous to Beans laid on a ſhallow Ground, and covered over, *&c.*

SECT. VII.

Of the General Uſes of Corn, Grain, Pulſe, and other Seeds propagated by the Plough.

This is the moſt general Grain uſed here in *England* for Bread, although it be not unfit for moſt of the uſes the other Grains are fit for: As for Beer, the beſt Beer to keep hath uſually a proportion of Wheat added to the Malt; and the Bran alſo of Wheat a little thereof boyled in our ordinary Beer, maketh it mantle or flower in the Cup when it is poured out; which ſheweth with what a rich ſpirit Wheat is endowed withal, that ſo much remains in the very Bran. Alſo Starch is made of muſty and unwholeſome Wheat, and of the Bran thereof, than which there are few things whiter. *uſe of Wheat.*

Its principal Uſe is for the making of Beer, being the ſweeteſt and moſt pleaſant Grain for that purpoſe; it is alſo one of the beſt Grains for fatting of Swine, eſpecially being either boyled till it be ready to break, with no more water than it drinks up; or ground in a Mill, and wet into a Paſte, or made into a Meſh, either way it produces moſt excellent ſweet Bacon. *Of Barley.*

Its general Uſe is for Bread, either of it ſelf or mixed with Wheat; it makes Bread moiſt, and gives it a very pleaſant taſte to moſt Appetites. I know no other particular uſe thereof (it being not univerſally propagated) only it's reported that it yields great ſtore of *Spirit* or *Aqua vitæ*. *Of Rye.*

This is the only Grain for a Horſe, and beſt agrees with that Beaſt of any other, and in which the Horſe moſt delighteth; and is a conſtant food either for *Bread*, *Cakes*, or *Oatmeal* to the *Scots*, and ſeveral Northern places in *England*, and in ſome part of *Wales*. *Oats* alſo will make indifferent good *Malt*, and a little thereof in ſtrong Beer to be kept, is uſual. They are a Grain that Poultrey alſo love to feed on, and it makes them lay ſtore of Eggs above what other Grain doth. *Of Oats.*

The common Uſe of Pulſes are generally known, as well for Men as Beaſts; but there are ſeveral that pretend to extract from them excellent Liquors, and diſtil very good *Spirits* or *Aqua Vitæ*, without maulting, as one (in a certain *Tract* publiſhed by Mr. *Hartlib*) pretends, that Rye, Oats, Peaſe, and the like inferior ſort of Grains, handled as *Barley* until it ſprout, needing not for this work to be dried, but beaten and moiſtened with its own Liquor, and ſoundly fermented, will yield a monſtrous increaſe. He alſo affirms, that out of one Buſhel of good Peaſe will come of *Spirit* at the leaſt two Gallons or more, which will be as ſtrong as the ſtrongeſt Anniſeed-Water uſually ſold in *London*: this he affirms to *Of Pulſes.*

be of the leaſt. He afterwards in the ſame Tract gives the partilar Proceſs, which is thus:

Let Peaſe be taken and ſteeped in as much Water as will cover them, till they ſwell and Corn, and be ſo ordered as Barley is for Maulting; only with this difference, that for this work if they ſprout twice as much as Barley doth in Maulting, 'tis the better. The Peaſe thus ſprouted, if beaten ſmall, which is eaſily done they being ſo tender, put into a Veſſel and ſtopt with a Bung and Rag, as uſually, theſe will ferment; and after two, or three, or four Months, if diſtilled, will really perform what before is promiſed.

Thus (he alſo adds) may a *Spirit* or *Aqua Vitæ* be made out of any green growing thing, Roots, Berries, Seeds, *&c.* which are not oyly.

Alſo that the *Spirit* which is made out of *Grain* not dried into *Mault*, is more pleaſant than the other.

It is not unlikely that *Grain* may afford its *tincture*, and that excellent *Beer* or *Ale* may be made thereof without *Maulting*: but theſe things require in another place to be treated of; and alſo of the different ways of *Fermenting Liquors*, which we refer to another time and place.

The uſes of Hemp-ſeed, Flax-ſeed, Rape and Cole-ſeed.

Hemp-ſeed is much commended for the feeding of Poultrey and other Fowl, ſo that where plenty thereof may be had, and a good return for Fowl, the uſe thereof muſt needs be advantageous, ordered as you ſhall finde hereafter when we treat of Poultrey.

Flax-ſeed or *Lin-ſeed*, *Rape* and *Cole-ſeed*, are generally made uſe of for the making of *Oyl*.

Of the Preſervation of Corn.

The Preſervation of *Corn* when it is plenty and good, is of very great advantage to the Huſbandman, and the Kingdom in general; for in ſcarce and dear years the Huſbandman hath little to ſell to advance his Stock, and the Buyers are uſually furniſhed with muſty and bad *Corn*, from Forein parts, or from ſuch that were ignorant of the ways to preſerve it.

Therefore in cheap years it will be very neceſſary to make uſe of ſome of theſe ways for the ſtoring up your Plenty of *Corn*, againſt a time of Scarcity.

On Reeck-ſtavals.

The way of making of it up in *Reecks*, on *Reeck-ſtavals*, ſet on ſtones that the Mice may not come at it, is uſual and common.

Corn laid up with Chaff.

But *Corn* thraſhed and clean winnowed is apt to be muſty, therefore ſome adviſe that you lay up your *Corn* in the Chaff in large Granaries made for that purpoſe ſecure from the Mice; and when you uſe or ſell it, then to winnow it.

Corn laid up with Beans.

Alſo it is adviſed to mix *Beans* with *Corn*, and that it will preſerve it from heating and muſtineſs. It is probable that if the *Beans* be well dried on a Kiln it may ſucceed, for then will they attract all ſuperfluous moiſture unto them, which is the only cauſe of

the

the injury to the *Corn*: for in *Egypt* where it is so dry, *Corn* will keep in open Granaries many years, as in *Pharaoh's* time. The Beans are easily separated afterwards from the *Corn*.

It is also reported, that pieces of Iron, Flints, Pebles, &c. mixed with *Corn*, preserves it from heating; which may be true, for it is usual to set a stick an end in *Corn*, only to give passage for the Air to prevent heating. A large Granary also full of square wooden pipes, full of small holes, may keep long from heating, though not so well as the *Chaff*, *Beans*, &c. *Iron, stones, &c mixed with Corn.*

Also some have had two Granaries, the one over the other, and filled the upper, which had a small hole in the bottom, that the *Corn* by degrees, like Sand in an Hour-glass, hath fallen into the lower; and when it was all in the lower, they removed it into the upper, and so kept it in continual motion: which is a good way also to preserve it. *A double Granary, one over the other.*

SECT. VIII.

Of the Preparation of the Seed.

The greatest part of Vegetables, and more especially those whereof we have before treated, are propagated of Seed, which included in a very small shell, skin, or husk, containeth the very *Quintessence* of the Plant that produced it, and is as it were the Life and Spirit of the Vegetable, coagulated into a small compass. *Etenim* [Natura] *è tota Plantæ mole nobiliores & maximè activas particulas segregat, easque cum pauxillo terræ & aquæ simul colligat, in* Semina *velut Plantæ cujusvis quintas essentias efformat; interim truncus, folia, caules, & reliqua Plantæ membra, principiis activis, pene orbata, valdè depauperantur, ac minoris efficaciæ ac virtutis existunt.* This *Seed* or *Spirit* of the Plant being cast into its proper *Matrix* or *Menstruum*, in its proper time, doth attract unto its self its proper nourishment or moisture, which by its own strength or power it doth ferment, and transmute that which was before another thing, now into its own being, substance or nature, and thereby doth dispand its self, and encrease into the *form* and *matter* by *Nature* designed. A more *Philosophick* Definition and Dissection of the nature of the Seed and Vegetation, we will leave to the more Learned, and content our selves in our *Rural Habitation* with so much of the understanding thereof, as shall guide us unto the Discovery and Application of what may be this proper *Menstruum* wherein each Seed most rejoyceth in, and with most delight attracteth; for it is most evident, that every Seed as it differs in nature from another, so it requires a different nourishment. For we perceive that in the same Land one sort of Seed will thrive where another will not, according to the Proverb, *Ones Meat is anothers Poyson*; and that any sort of Grain or Seed will in time extract and diminish such Nutriment that it most delights in. Which is the cause that our Husbandmen do finde so great an Advantage and Improvement by changing their Seed, espe- *Dr. Willis de Fermentatione.* *Change of Seed an Improvement.*

especially from that Land which is often tilled, which they call *Hook-Land*, into Land newly broken; and from dry, barren, and hungry Land, to rich and fat Land; also from Land inclining to the *South*, to Land inclining to the *North*, & *è contra*; all which produce a good Improvement. As Cattle that are taken out of short, sour, and bad Pasture, and put into good sweet Pasture, thrive better than such that are not so exchanged. After the same manner it is with Trees removed out of bad Ground into good; all which are manifest Signes that there is some particular thing wherein each Seed delights: which if we did but understand, we might properly apply it, and gain Riches and Honour to our selves; but because we are ignorant thereof, and are content so to remain, we will make use of such Soyls, Dungs, Composts, and other Preparations and Ways of Advancement of the Growth of Vegetables, as are already discovered and made use of, and shall here give unto the *Reader* the several Ways and Methods we finde dispersed in our *Rustick Authors* for the imbibition of the Seed, which hath been long attempted, and many ways tried; but most of them have fallen short of the expectation of the Experimenters, because they neither took the right Matter, nor observed the right manner of the Operation. As according to some Authors you are prescribed to steep your *Corn* in Dung-water, or Water wherein Cow-dung hath lain some time, which its probable may be some, though little advantage to the *Corn*.

Steeping of Corn in Dung-water.

Then in one of the same Authors are ye commended to an Experiment better than the former, That whereas before you steeped your *Corn* in the *Water* which had sucked out the strength and salt of the *Dung*, you must now mingle your *Dung*, your *Water* and your *Corn* together, and stir them one whole hour at the least; also in the evening stir them again for half an hour or more, let them stand together all night, and the next day at some tap draw away the Water, then mingle the *Corn* and *Dung* throughly well together, and after sowe the *Dung* and *Corn* so mixed in a barren and hungry mould, and you shall have (saith mine Author) as rich a Crop, as if the Ground it self had been dunged before; he giveth also a *Probatum est* unto it.

Adam's Tool Revived.

The same Sir *Hugh Platt* gives you a process of steeping *Corn* out of *Johannes Baptista Porta*, which he pretends to cause a wonderful encrease, and at least five for one above the accustomed yield, which is, *To take the Corn out of the middle of the Ear, and bathe it in sweet Ointment made with the fat of old Goats, being mixed with Bacchus and Vulcan* [which our Author interprets to be Goats-dung, the older the better, moistened with Wine, or new Must, or I rather judge Lees of Wine] *let their soft and even laid bed be gently warmed:* [which he also Interprets to be the Digging of the Land; and by warming, it's probable he means soyling or watering it with some prepared rich Liquor.]

Also our *Author* there advises for the steeping of *Corn* in *new Ale* or *Wort*, its own natural Bathe; but seems to prefer the steeping thereof in the *Water* wherein the Dung of *Oxen*, *Kine*, and *Sheep*, and

and *Pigeons-dung* hath been imbibed, which he preſcribes to be about two parts of Water to one of Dung, and let them ſtand four or five days, often ſtirring them together; which water decanted or courſly filtred is fit for your uſe, wherein you are to ſteep your *Corn* till it be glutted therewith; which you may eaſily diſcover: but be ſure not to overcharge the *Corn* with this Liquor.

Thus far we finde how the ſteeping of *Corn* in Dung-water hath been uſed and approved of, and that as may be preſumed from the rationality of the thing, and credit of the Author, with ſome good ſucceſs; But it is probable it might not always anſwer the expectation of the Experimenters, or at leaſt not to produce ſo great an Increaſe as the Authors promiſe; neither can thoſe ways be ſo excellent as theſe we ſhall adviſe you to, being grounded on more rational Principles, and have been proved to be more effectual than the other.

That which containeth in it moſt of the *Univerſal Subject* or *Matter* of *Vegetables* (whereof we diſcourſed at the beginning of this Treatiſe) is the fitteſt for this purpoſe; of all which, *Nitre* or *Sal terræ* is eſteemed the beſt, wherewith *Virgil* adviſeth to infuſe or beſprinkle the Seed:

Semina vidi equidem multos medicare ſerentes
Et intro prius — profundere ——

This alſo is that Subject *Glauber* ſo highly extols, where he ſays, *Si Agricolæ ſemen hoc menſtruo humectatum in agrum ſpargunt, citius matureſcit, granis pinguioribus*, &c. *If Husbandmen did ſowe their Seed imbibed with this Menſtruum, it would ſooner be ripe, and bear better Grain*, &c. This *Subject* or *Menſtruum* he labours in ſeveral Tracts of his, to prefer above any other matter whatſoever, for all ſorts of Vegetables, either by application thereof unto the roots, or by way of irrigation, or by imbibition of the Seed therein, as very highly conducing to Fertility and acceleration of Maturation; but in another Tract of his, being the Explication of the former, he very honeſtly undeceives all ſuch that judge this *Nitre* or *Subject* to be common *Nitre* or *Salt-petre*. *Velim autem mentem intelligi meam non accipiendum eſſe nitrum commune, hiſce minime proficuum*; Common Nitre being not fit for that purpoſe. The *Nitre* or *Sal terræ* intended by theſe and other Learned Authors as apt for this work, is the fixed Salt extracted out of any *Vegetable*, *Animal*, or *Mineral* throughly calcined, as after the burning of Land in the common way of *burn-baiting*, that which cauſeth ſo great Fertility is as well the fixed *Salt* or *Alcali* that's left in the *Aſhes*, as the waſte or expence of the ſterile acid Spirit which before kept that vegetating Salt from acting. What is it that is fertile in Lime, Aſhes, Soap-aſhes, &c. but this *Nitre*, or *Sal terræ*, this *Univerſal Subject* left therein, and moſt eaſily ſeparable after calcination?

Therefore let every *Husbandman* that expects ſo large a Product or Reward, take the right matter; ſuch that *Glauber* caſt on his

Miraculum Mundi, p. 58.

Explicatio Miraculi Mundi. 51.

Idem 46.

Aſparagus, which through its fiery nature deſtroyed the Worms, or baniſhed them wholly from their ancient habitations, and by its vegetating and fructifying nature it made the *Aſparagus* thrive more fully and perfectly than before, *&c.* This Salt is as eaſie to be procured, as the *Lee* or *Lixivium* wherewith the women uſually ſcour their Clothes, being extracted out of any *Aſhes*, either of *Vegetables*, *Animals*, or *Minerals*. All the difficulty is in the true proportion and ſtrength of this *Lixivium* or *Menſtruum*: for *Glauber* adviſes in another *Tract* of his, by no means to add too much thereof to the *Vines*, leſt they grow too rank: but in our way of Imbibition of Grain, we need not fear that; only this we muſt be cautious of, that the great and fiery heat thereof deſtroyeth not the *Corn*, for the higheſt Medicines taken in exceſs, prove the greateſt Poyſons: but let not this prove a Diſcouragement, for it cannot be difficult to prevent this Inconvenience, either by moderating the quality of the *Menſtruum*, or the time of imbibition.

Continuatio Miraculi Mundi, 21.

Next in place to this *Univerſal Subject* may be uſed ſuch materials that contain moſt of the ſame, as the Dung of *Sheep*, *Pigeons*, and other *Fowl*, who becauſe they make no *Urine*, have their Dung enriched with a greater quantity of that *Subject* than other Creatures, whence it is uſually extracted by the *Urine*: *Sheep* alſo drink but little, and feed dry, which makes their Dung exceeding rich and fertile. I caſually met with the following *Proceſs* highly applauded by the Owners thereof, promiſing wonderful Productions from it, which is thus:

Take half a Buſhel of Sheeps-dung, and put upon it twenty quarts of Spring-water, ſet it on the fire till it be luke-warm, but not boyling, and ſo rub with your hand all the Sheeps-dung by little and little (till it be diſſolved in the water) then let it ſtand twelve hours, after which ſtrain the water through a courſe Cloth, with a hard Compreſſion; this water keep for uſe: Then take of Bay-ſalt and diſſolve it in luke-warm water, which water filter and evaporate in an earthen Veſſel over the Fire; of this congealed Salt after the waters Evaporation, take two good handfuls, likewiſe do the ſame with Salt-petre, diſſolve it in water, filter the water, and evaporate it; then take of the remaining congealed Salt-petre one good handful, and let both thoſe Salts diſſolve in the fore-mentioned Liquor of Sheeps-dung, making it again milk-warm: when all the Salts are therein well diſſolved, put into that prepared Liquor eight Gallons of Corn, or other Seed, and let it ſteep therein thirty or thirty ſix hours; then take it and put it into a Sieve, and drain the water into another Veſſel, which water may be uſed again in like manner: when the water is all drained away, take the *Corn* or other Seed and dry it in ſome Upper-loft expoſed to the Air, not to the Sun, and being almoſt dry, ſcatter or ſowe it in half proportion: *N.B.* that the Sheeps-dung dregs being dried muſt be calcined, and the Salt thereof drawn in luke-warm water, which being filtred and evaporated, the remaining Salt thereof is

to

to be diſſolved with the other Salts in the Sheeps-dung water.

I have here given you this Proceſs *gratis*, which hath been valued and contracted for at a high rate, the Owners promiſing a very great Increaſe to ſucceed. The Proceſs appears to be made not by ſuch that are experienced in Rural Affairs, for you will finde it difficult to ſtrain your Sheeps-dung water, diſſolved in thoſe proportions; for the Sheeps-dung wholly diſſolves, which doth ſo thicken the water, and convert it into a mucilage, that all goes where the water goes, if rightly done; and that which is more ſtrange, the Grain will not only imbibe the water ſo *animated*, but the very ſubſtance of the Dung alſo, if rightly ordered; which is an Argument ſufficient of the melioration of the Grain, inſomuch that no dregs or remainder of the Sheeps-dung was loſt, ſave only a few undiſſolved treddles. As for the Salts, I think little good is to be expected from them, and therefore hold thoſe troubleſom preparations of them needleſs; only the Salt of the Dung muſt needs be good, becauſe it is that *Vegetative Salt*, or *Univerſal Subject* whereof we diſcourſed before, only it is far fetched and dear bought: as good may be had at a far eaſier rate for this purpoſe.

Nevertheleſs common *Sea-ſalt* hath been much cried up by ſome for an Improver of the Seed, and an Example produced of a ſilly Swain, who paſſing over an Arm of the Sea with his Seed-corn in a Sack, which by miſchance at his landing fell into the water, and ſo his Corn being left there till the next low water, became ſomewhat brackiſh, yet (out of neceſſity) did the man beſtow the ſame Wheat upon his ploughed Grounds, and at the Harveſt he reaped a Crop of good Wheat, ſuch as in that year not any of his Neighbors had the like. *Jewel-houſe of Art and Nature.*

Doubtleſs infuſion of the Corn or Seed in any of the aforeſaid materials, is ſome advantage to it; or in the Lees of Wine, Ale, Beer, Perry, Syder, or elſe in Beef-broth and the Brine of Poudering-tubs, as is by ſome adviſed.

Alſo ſome affirm that Corn ſpritted a little, as they uſe to do for Mault, and then ſown, came up ſpeedily, and got the predomination of the Weeds at firſt, and ſo kept the ſame, that there was produced a far greater increaſe than ordinary; which is a ſufficient convincing Argument, that if common water produce ſo manifeſt an Improvement, that then a better Liquor may much more.

Becauſe the Corn alſo will ſeem troubleſom to ſowe being wet, it is preſcribed either to let it dry a day or two on a Floor, or elſe to ſift ſlackened Lime thereon, which is to be preferred, becauſe it preſerves the Corn from Vermine, Smutt, *&c.*

I find alſo another compounded Liquor to have been commended and experimented for the ſteeping of Grain therein, which is thus: Pour into quick and unſlaked Lime, as much Water as ſufficeth to make it ſwim four inches above the Water, and unto ten pound of the ſaid water poured off, mix one pound of *Aqua Vitæ*, and in that Liquor ſteep or ſoak wheat or Corn twenty four hours; which being dried in the Sun, or in the Air, ſteep again in the ſaid Liquor Hartlib's *Legacie.*

Liquor twenty four hours more; and do it likewiſe the third time: afterward ſowe them at great diſtances the one from the other, about the diſtance of a foot between each Grain, ſo one Grain will produce thirty, thirty ſix, thirty eight, forty two, fifty two Ears, and thoſe very fruitful, with a tall Stalk equalling the ſtature of a man in height.

This ſeems to be a moſt rational Proceſs for this purpoſe, and on this and the like ways of maceration or fermentation of the Seed depends thoſe ſeveral Experiments, where the *Corn* or Seed hath yielded ſo prodigious an Increaſe, as that one grain of Wheat ſhould yield a hundred and fourteen Ears, and in them ſix thouſand Grains: but in caſe it generally hold to be but a quarter of the number, it is beyond what any other way of Huſbandry can perform.

CHAP. V.

Of the Manuring, Dunging, and Soyling of Lands.

HAving diſcourſed of *Meadows*, *Paſtures*, and *Arable Lands*, and of the great Advantages and Benefits that are raiſed out of them, and of the ſeveral ways of Improving *Meadows* by drowning or watering, and of *Paſtures* and *Arable Lands* by Incloſure, by ſowing and propagating New Hays, Graſſes, and the beſt ſorts of Corn, Pulſe, and other Seeds, and by the beſt way of Tilling and Ordering the ſame: Now it will be neceſſary to ſay a little concerning this moſt general way of Improvement by *Manuring*, *Dunging*, and *Soyling* of *Land*; under which terms we comprehend all the ſeveral ways of tempering, altering, renewing, or adding unto the Land, or applying any ſubject whatſoever thereunto for its Improvement and Advantage.

SECT. I.

Of the Burning of Land.

The Burning of Land, or any other operation on it by *Fire*, ſeems to be the greateſt, though not moſt univerſal advance to moſt of our barren, poor and hungry Lands, as well dry as wet: the Burning of the Ground it ſelf ſeems to be of very Ancient uſe, as appears by *Virgil*:

Sæpe etiam ſteriles incendere profuit agros.

Gages *Survey of the* Weſt-Indies. Sylva. And burning of Wood, and other Combuſtible Materials on Land, is practiſed amongſt the *Americans* for the Improvement of their

their Land; which is an Argument as well of their Natural Ingenuity, as of the excellencie and advantage of the Improvement. For the burning of ſuch Combuſtible things on Land, doth very much heat the Ground, and waſtes that *Acid* ſterile juice that hinders fertility, and ſets free that fertile Principle the *Sal terræ* which before was for the moſt part bound up; alſo it leaves a good quantity of that Salt on the Land mixed with the aſhes, which is generally held to be the only advantage this way yields, though the contrary appears; for whereſoever the Fire is made, although you remove the aſhes wholly, yet will the place bear a better Crop than where you beſtow the aſhes, as formerly we noted.

On what lands burn-baiting good.

This Art of Burning of Land, uſually called *Denſhiring* (*quaſi Devonſhiring* or *Denbighſhiring*, becauſe it ſeems there to be moſt uſed or to have been invented) or burn-bearing, is not applicable or neceſſary to all ſorts of Land: for in a good, fertile, rich, looſe Soyl, where a good ſweet Graſs, or good Corn flouriſheth, it waſtes as well the good as the bad juyce; wherefore in moſt places in *Sommerſetſhire*, and ſuch other fertile places, they reject it.

But for barren, ſour, heathy, and ruſhey Land, be it either hot or cold, wet or dry, it is a very great Improvement, inſomuch that moſt ſorts of ſuch poor Lands will yield in two or three years after ſuch Burning more above all charges, than the Inheritance was worth before.

Manner of burn-baiting.

The moſt uſual Method is, with a Breaſt-plough to pare off the Turf, turning it over as it's cut that it may dry the better: if it prove a very dry ſeaſon and the weather hot, then it needs no more turning; but if the weather be caſual, it muſt be turned, and the Turfs ſet a little hollow, that they may dry the better, and when they are through-dry, they may be laid on ſmall heaps about two Wheel-barrow loads on a heap: the leſſer the heaps are the better, ſo there be enough to make a good Fire throughly to conſume the whole to aſhes. If the Turf be full of fibrous roots, or hath a good head on it, it will burn without any other additionary fewel; if not, you muſt raiſe your heap on a ſmall bundle of Ling, Goſs, Fearn or ſuch-like, which in ſome places they call Ollet, which will ſet the whole on Fire: you may afterwards let thoſe little hills of *Aſhes* lie till they are a little ſaddned with rain, before you ſpread them, or take a quiet time that the wind may not waſte your aſhes, nor hinder their equal ſcattering; alſo you muſt pare the ground under the *hills* ſomewhat lower than the ſurface of the Earth, to abate its over-great fertility, cauſed by the Fire made thereon. It is alſo to be obſerved that the Land is to be but ſhallow or half Ploughed, and not above half the uſual quantity of ſeed ſown on an Acre, and that alſo late in the year; if Wheat, towards the end of *October*, only to prevent the exceſſive rankneſs or greatneſs of the Corn, by which you may judge what advantage Burning is to the Land, and this alſo on the pooreſt Plains or Heaths.

Others there are that when they ſtubb up their *Goſs*, *Broom*, and ſuch-like, lay the Roots on heaps when they are dry, and cover them

them with the parings of the Earth between where they raiſed the roots, and ſo Burn over the Land, which is alſo a very conſiderable Improvement.

In ſome places alſo it is uſual to Burn the ſtubble and other traſh they can rake together on their Lands, which muſt needs be very good ſo far as may be according to the quantity thereof, although it be not ſo much uſed for fertility-ſake, as to rid themſelves of the ſtuff, as they uſually burn Heaths and Turf-Commons to give liberty to the Graſs.

Sir *Richard Weſton* gives this for a good way, that is, Firſt pare off the Heath [or Turff] then make the paring into little Hills: you may put to one hill as much paring as comes off from a Rod or Pole of Ground.

The Hills being ſufficiently made and prepared, are to be fired and burnt into aſhes; and unto the Aſhes of every Hill you muſt put a peck of unſlaked Lime: the Lime is to be covered over with the Aſhes, and ſo to ſtand till rain comes and ſlakes the Lime, after that mingle your Aſhes and Lime together, and ſo ſpread it over your Land.

In ſuch places where Fewel is not ſcarce, and the Land barren, it is very excellent Huſbandry to get together into ſuch Land you intend to fertilize, all the ſmall Wood, Buſhes, Furze, Broom, Heath, Fearn, Stubble, or what ever combuſtible matter you can procure, which in moſt places are eaſier obtained than Dung; and in a dry time lay it in heaps diſperſedly about the ground, and caſt over it the parings of the Land where it lies, and ſet fire to it, and whileſt it burns (having ſeveral to help you) caſt on Turf or Earth on the moſt flaming parts, to hinder that it flame not too much; the heat of which fires will ſo calcine the Earth under them, and the Earth caſt on them, beſides the aſhes of the Vegetables, that it will yield an increaſe far exceeding the charge and labor beſtowed thereon: there can be no better uſe made of theſe combuſtible matters, and eſpecially of the Hawme or ſtrings of Hops, which burnt in the Hop-garden, and the parings of the Turfs on the ſide of the Garden, or elſewhere, or any other Earth caſt over it as it burns, and then more Hawme over that, and more Earth on that, as they uſe to ſay, *Stratum ſuper ſtratum*, till all be done, either in one or ſeveral places, will make ſo excellent a Compoſt to be applied to the Hop-hills, that none can exceed it, which I my ſelf have done: And this anſwers to what *Glauber* delivers as a great ſecret, and very profitable: *Perticæ, Longurii, aut pali, quibus Vites lupulorum Caules ſuſtinenter, ſi igne, quà in extremitatem ſuam inferiorem deſunt, adurantur, & extremitate adusta, in lignorum oleum illud immittantur, ut pinguedinem illam imbibant,* &c. *duplex hoc pacto emolumentum afferentes; prius eſt quod perticæ à putredine conſervatæ quotannis breviores non evadant, ſed diutius durent: Alterum quod vitium & lupulorum radices pinguedinem & alimentum ex perticarum extremitatibus attrahentes luxuriante incremento excreſcant.* By which it appears, that the ends of the Hop-poles only being burnt and imbibed in his *vege-*

Continuatio Miraculi Mundi, *p.* 34.

table

table Oyl, or *fixed Salt*, will not only endure long from rotting, but alſo will yield extraordinary nouriſhment to the Roots of the Hops; of ſuch wonderful efficacie is this ſubject, that the leaſt Grain thereof carrieth with it much of fertility, as the ſame Author ſaith a little before of the ſame *Subject*; *Non tantum in agris præſtat, ſed etiam arboribus, & vitibus, adeo ut una eodem plena tonna tantum ad agrorum ſtercorationem conferre valeat, quantum decem ſimo equino, aut vaccine repleta plauſtra ſolent.* Page 21.

This kinde of *Manure* either by Burning as before, or with the fixed Salts of any thing whatſoever, doth alſo much more enrich your Crop than any other Dung or Soil, for this tendeth principally unto fertility, ordinary Dung of Beaſts more unto the groſs ſubſtance of the Straw or Hawme, than unto Fruit or Seed, and alſo breeds more of Weeds than this our *Univerſal Subject*.

There are alſo ſeveral other ſorts of Materials to be uſed, as Soils and Manures for the fertilizing and enriching of Lands: Some whereof are taken from the Earth, as *Chalk*, *Marle*, *Clay*, &c. Others from the Waters, as Sands, Weeds, *&c.* Others alſo are the Dungs and Excrements of living Creatures, and others that are ſeveral ſorts of Vegetables themſelves, and other caſual things, as Soot, Raggs, *&c.* Of all which we finde theſe whereof we ſhall now treat, to have been found out and commended to be uſeful and beneficial to the Huſbandman for the purpoſes before mentioned. *Other Soyls and Manures.*

SECT. II.

Soyls and Manures taken from the Earth.

Whereof there are ſeveral ſorts; ſome of ſo hard and undiſſoluble a nature, that it is not fit to lay on Lands ſimply as it is, but after it is burned into *Lime*, becomes a very excellent Improver of Lands: there are alſo other ſorts of *Chalk* more unctuous and ſoluble, which being laid on Lands crude as they are, and let lie till the *Froſts* and *Rain* ſhatter and diſſolve the ſame, prove a very conſiderable advantage to *barren Lands*; now where any of theſe *Chalks* are found, it is good to prove their natures, by laying them on ſome ſmall portion of Land crude as they are, or by burning them into *Lime*, if Fewel be plenty, or to half burn them; by which you may experimentally know the true effects and benefits that *Subject* will yield. *Of Chalk.*

And although *Chalk* ſimply of it ſelf either burnt or unburnt, may not prove ſo advantageous as many have reported, yet is it of very great uſe to be mixed with *Earth* and the *Dungs* of Animals, by which may be made an admirable, ſure, and natural fruitful Compoſition for almoſt any ſorts of Lands, and raiſeth Corn in abundance.

Liming of Land is of moſt excellent uſe, many barren parts of this *Nation* being thereby reduced into ſo fertile a condition for bearing moſt ſorts of Grain, that upon Land not worth above *Of Lime.*

one

one or two ſhillings an Acre well huſbanded with *Lime* hath been raiſed as good *Wheat*, *Barly*, *white* and *gray Peaſe* as *England* yields. *Engliſh Improver.*

Alſo that by the ſame means from a Ling, Heath, or Common naturally barren and little worth, hath been raiſed moſt gallant *Corn*, worth five or ſix pound an Acre. *By the ſame Author.*

He alſo affirms that ſome men have had and received ſo much profit upon their Lands by once *liming*, as hath paid the purchaſe of their Lands, and that himſelf had great advance thereby, yet lived twenty miles from *Lime*, and fetched the ſame by Waggon ſo far to lay it on his Lands.

One Author ſaith twelve or fourteen quarters will *Lime* an Acre; another ſaith 160 Buſhels: the difference of the Land may require a different proportion.

The moſt natural Land for *Lime* is the light and ſandy, the next mixt and gravelly; wet and cold gravel not good, cold clay the worſt of all.

Alſo a mixture of Lime, Earth, and Dung together, is a very excellent Compoſt for Land.

Of Marle.

Differences of Marle.

Marle is a very excellent thing, commended of all that either write or practiſe any thing in Huſbandry. There are ſeveral kinds of it, ſome *ſtony*, ſome *ſoft*, *white*, *gray*, *ruſſet*, *yellow*, *blew*, *black*, and ſome *red*: It is of a cold nature, and ſaddens Land exceedingly; and very heavy it is, and will go downwards, though not ſo much as *Lime* doth. The goodneſs or badneſs thereof is not known ſo much by the colour, as by the Purity and Uncompoundedneſs of it; for if it will break into bits like a Dye, or ſmooth like Lead-Oar, without any compoſition of Sand or Gravel; or if it will ſlake like Slate-ſtones, and ſlake or ſhatter after a ſhower of Rain, or being expoſed to the Sun or Air, and ſhortly after turn to duſt when it's throughly dry again, and not congeal like tough Clay, queſtion not the fruitfulneſs of it, notwithſtanding the difference of *colours*, which are no certain ſignes of the goodneſs of the *Marle*. As for the *Slipperineſs*, *Viſcouſneſs*, *Fattineſs*, or *Oylineſs* thereof, although it be commonly eſteemed a ſigne of good *Marle*, yet the beſt Authors affirm the contrary, *viz.* That there is very good *Marle* which is not ſo, but lieth in the *Mine* pure, dry and ſhort, yet nevertheleſs if you water it you ſhall finde it ſlippery. But the beſt and trueſt Rule to know the richneſs and profit of your *Marle*, is to try a Load or two on your Lands in ſeveral places, and in different proportions.

Signes of good or bad Marle.

Beſt way to know Marle.

Uſe and Benefit of Marle.

They uſually lay the ſame on ſmall heaps, and diſperſe it over the whole Field, as they do their *Dung*; and this *Marle* will keep the Land whereon it is laid, in ſome places ten or fifteen, and in ſome places thirty years in heart: it is moſt profitable in dry, light, and barren Lands, ſuch as is moſt kinde and natural for *Rye*, as is evident by Mr. *Blithes* Experiment in his Chapter of *Marle*. It alſo affordeth not its vertue or ſtrength the firſt year, ſo much as in the ſubſequent years. It yields a very great Increaſe and Advantage on high, ſandy, gravelly, or mixed Lands, though

though never ſo barren, ſtrong Clay-ground is unſutable to it: yet if it can be laid dry, *Marle* may be profitable on that alſo.

It is very neceſſary in *marling* Lands to finde out the true proportion, how much on every Acre, that you add not too much, nor too little *(in medio virtus.)* It's better to erre by laying on too little than too much, becauſe you may add more at pleaſure, but you cannot take away; the ſureſt way is to try ſome ſmall quantities firſt, and proceed as your Experiments encourage. It hath been alſo experimentally obſerved, that you are to lay your *Marle* in the beginning of Winter on hard and binding Grounds. And on the contrary, you are to lay it in the Spring on light, ſandy, dry, and gravelly Lands, but it's good to try both; it's held to be beſt to lay it abroad in the beginning of Winter, that the Froſts may firſt make the ſame moulder into ſmall pieces, and ſo to become apt for Solution, which is done by the Rains that more plentifully fall in the Winter.

Of Fullers Earth.

You ſhall obſerve (ſaith *Markham*) that if you cannot get any perfect and rich *Marle*, if then you can get of that *Earth* which is called *Fullers-Earth*, and where the one is not, commonly the other is, then you may uſe it in the ſame manner as you ſhould do *Marle*. and it is found to be very near as profitable.

Mr. *Bernhard Paliſſy* (that French Author cited ſo often by Sir *Hugh Platt*,) commends the ſame; I have not known it at any time practiſed in *England* for the bettering of any ground (ſaith Sir *Hugh Platt*) but by all preſumption the ſame muſt of neceſſity be very rich, becauſe it is full of that vegetative Salt, which appears in theſe ſcouring effects, for the which it is divers ways had in uſe amongſt us.

Of clay. Jewel-houſe of Art and Nature.

Clay is by many commended to be a conſiderable Improvement to ſome ſorts of light and ſandy Ground, as Sir *Hugh Platt* gives the relation of a certain perſon that aſſured it to be moſt true that the very Clay which he digged up in *St. Georges Fields* being laid upon his paſture-ground which he there held by Leaſe, did exceedingly enrich the ſame, inſomuch as he did never regard to ſeek after any other Soil.

Alſo Mr. *Gabriel Platt* relates that he knew light ſandy ground which was good for little or nothing, cured by laying thereon a great quantity of ſtiff *Clay-ground* which converted it to good temperament, whereby it became fruitful, and not ſubject to fail upon every light occaſion as it did before, but would abide variety of weather according to the nature of Haſel-ground: And this Improvement (ſaith he) is of no little value, for there is a great difference betwixt Land that is ſubject to fail once in two or three years, and Land thus improved that will not fail once in two or three and twenty years through the diſtemperature of the weather.

Mr. *Bernhard* alſo affirms that all *Marle* is a kind of *Clay-ground*, and it ſhould ſeem to differ only in digeſtion from *Marle*.

It is good to try it on ſeveral grounds both Arable and Paſture, and for ſeveral Grains at ſeveral times in the year, and in ſeveral pro-

proportions, by this means you may finde out the true value and effect of this, and by the ſame Method of all other *Subterraneal Soyl* or *Manure*, and thereby raiſe unto your ſelf a conſiderable advantage.

Of Sand. By the ſame Rule, and for the ſame Reaſon that *Clay* advanceth the benefit of light and Sandy grounds, may *Sand* be an inrichment and Improvement to cold *Clay*-grounds, as Mr. *Gabriel Platt* teſtifieth that he hath known *ſtiff Clay-grounds* that would ſeldom be fruitful unleſs the ſeaſon of the year proved very proſperous, to have been cured by laying thereupon a great quantity of light *Sandy*-ground, which afterwards was converted to a good temperament, like to the ſort of ground commonly called Haſel-ground, which ſeldom or never faileth to be fruitful.

The beſt Sand for fertility is that which is waſhed from the hills or other *Sandy* places by the violence of *Rain*; other *Sands* that are digged, have little fertility in them, only by way of contracting to *Clay*-ground they may effect much, as *Columela* ſaith, that his Grandfather uſed to carry *Sand* on *Clay*, and on the contrary to bring *Clay* on *Sandy* grounds, and with good ſucceſs.

Sand alſo is of great uſe to be mixed with Soil, as Mr. *Blith* adviſeth; for the ſpeedy raiſing of great quantities of Soil in the Winter by the ſheep when foulding is generally neglected; and that is by making a large Sheep-houſe for the houſing of Sheep in Winter, which may be Sheep-cribbed round about and in the middle too, to fother them therein: you may bring herein once or twice a week ſeveral Loads of *Sand* either out of the Streets or ways, or from a *Sand-pit*, and lay it three or four inches thick, and ſo continue once or twice a week as long as you pleaſe; and what with the heat and warmth of their bodies, and the fatneſs of their Dung and Urine, the *Sand* will turn to excellent rich Soil, and go very far upon Land, and be more ſerviceable than you can conceive.

Of Earth. There are ſeveral ſorts of *Earth* that are of ſingular uſe for the bettering of Land, as all *Earth* of a Saltiſh nature is fruitful; eſpecially all ſuch *Earth* as lies dry covered with Hovels or Houſes, of which you make Salt-petre, is rich for Land, and ſo are old floors under any Buildings.

Mr *Platt* affirms that he hath known many hundred loads of *Earth* ſold for twelve pence a load being digged out of a Meadow near to *Hampton-Court*, which were carried three or four miles to the higher grounds, and fertilized thoſe grounds wonderfully, and recompenſed the labour and charges very well; which *Earth* being laid upon Arable Land within a Furlong of the ſame Meadow did more hurt than good: which ſheweth that the *Earth* muſt be of different nature from the Land whereon it is laid.

Alſo any ſort of *Earth* may be made uſe of for the folding of Sheep thereon under a Covert, after the *Flanders* Manner, as before is ſaid of Sand.

All ſorts of *Earth* are very uſeful to intermix with Lime, Dung of Beaſts, Fowl, or any other fatty ſubſtance being laid, *ſtratum*

ſuper

ſuper ſtratum, in pits or on heaps to putrifie together, as well to moderate the quality as to increaſe the quantity of your Soil.

Street-dirt in Towns and Villages is an excellent Improver of ſeveral ſorts of Land, eſpecially the light and ſandy.

SECT. III.

Soyls taken from the Sea or Water.

Of water-Sand.

The richeſt of all *Sands* is what comes from the *Sea-coaſts* and the Creeks thereof, and all Lands bordering on the Sea may be improved by them; it is the uſual practiſe in the Weſtern parts of *England* for the people to their great charge in carriage to convey the *Saltiſh Sands* unto their barren grounds, whereof ſome of them do lie five miles diſtance from the Sea, and yet they find the ſame exceeding profitable, for that their inheritance is thereby enriched for many years together, the greateſt vertue conſiſting in the Saltiſhneſs thereof.

Others ſay the Richneſs of the *Sands* is from the fat or filth the *Sea* doth gather in by Land-floods, and what the Tide fetches daily from the ſhores, and from fiſh, and from other matters that putrifie in the Sea, all which the Water caſts on ſhore, and purgeth forth of it ſelf, and leaves in the *Sands*, while it ſelf is clean and pure.

The *Sands* of *freſh Rivers* challenge alſo a place in our Improvements being laid on Land proper for the ſame, but more eſpecially if it be mixed with any other matter, as moſt uſually it is, where it is caſt on ſhelves at the falls of ſome Land-waters deſcending from Hills or High-ways.

Of Sea-weeds, and Weeds in Rivers.

In *Devonſhire* and *Cornwal*, and many other parts, they make a very great Improvement of the Sea-weeds for the Soiling and Manuring of their Land, and that to a very great advantage.

All manner of Sea-owſe, Owſy-mud, or Sea-weeds, or any ſuch-like, growing either in the Sea or freſh Rivers, whereof there is a very great quantity loſt and deſtroyed, are very good for the bettering of Land.

In *Cornwal* there is alſo a Weed called *Ore-weed*, whereof ſome grows upon Rocks under high Water-marks, and ſome is broken from the bottom of the Sea by rough weather, and caſt upon the next ſhore by the Wind and Flood, wherewith they Compoſt their Barly-Land.

Of Snayl-Cod, or Snag-greet.

It lieth frequently in deep Rivers, it is from a Mud or Sludge, it is very ſoft, full of Eyes and wrinkles, and little ſhells, is very rich; ſome they ſell for one ſhilling two pence the Load, another ſort they ſell for two ſhillings four pence the Load at the Rivers-ſide, which men fetch twenty miles an end for the Inriching of their Land for Corn and Graſs, one Load going as far as three

Load of the beſt Horſe or Cow-dung that can be had: It hath in it many Snails and Shells, which is conceived occaſioneth the fatneſs of it.

Of Oyſter-ſhells. I am very credibly informed that an Ingenious Gentleman living near the Sea-ſide, laid on his Lands great quantities of Oyſter-ſhells, which made his Neighbours laugh at him (as uſually they do at any thing beſides their own clowniſh road or cuſtom of ignorance) for the firſt and ſecond years they ſignified little; but afterwards they being ſo long expoſed to the weather and mixed with the moiſt Earth, they exceedingly enriched his Lands for many years after: which ſtands alſo with reaſon, the Shells of all ſuch Fiſh being only Salt congealed into ſuch a form, which when it is diſſolved of neceſſity muſt prove fertile.

Of Mud. There is in moſt Rivers a very good rich Mud of great fruitfulneſs, and unexpected advantage; it coſts nothing but labour in getting, it hath in it great worth and vertue, being the Soil of the Paſtures and Fields, Commons, Roads, Ways, Streets, and Backſides, all waſhed down by the flood, and ſetling in ſuch places where it meets with reſt.

There is likewiſe very great fertility in the reſidence of all Channels, Ponds, Pools, Lakes, and Ditches, where any ſtore of Waters do repoſe themſelves, but eſpecially where any ſtore of Rain-water hath a long time ſetled.

Of Fiſh. In Forein parts where *Fiſh* are plenty they prove an excellent Manure for Land; in ſome places here in *England* there are plenty of ſome ſorts of *Fiſh*, and at ſome ſeaſons not capable of being kept for a Market, it were better to make uſe of them for our advantage than not; I preſume they are of the beſt of Soils or Manures, but herein I ſubmit to experience.

Doubtleſs there is not any thing that proceeds from the Sea or other Waters, whether it be Fiſh or the Garbiſh of Fiſh, Vegetables, Shells, Sands, or Mud, or any ſuch-like diſſolving matter, but muſt be of very great advantage to the Huſbandman, if duly and judiciouſly applied.

SECT. IV.

Of Dungs or Excrementitious Soyls.

Of Horſe dung. This is the moſt common of any Dung whatſoever, by reaſon that Horſes are moſt kept in Stables, and their Soil preſerved, yielding a conſiderable price in moſt places; the higher the Horſes are fed, the better is the Dung by far: it is the only Dung in uſe whileſt it is new, for hot Beds, and other uſes for the Gardiner.

Of Cow, or Ox-dung. Next unto the Horſe-dung is Cow-dung, whereof by reaſon of its eaſie ſolution, hath been made the Water wherein Grain hath been ſteeped, and hath deceived many a plain-meaning Huſbandman, for there is not that richneſs nor vertue therein as many judge, for that purpoſe.

But this, together with Horſe-dung, or other Dung, is of very great advantage to Land if it be kept till it be old, and not laid abroad expoſed to the Sun and Wind, as is the practiſe of the ſeveral ignorant Huſbands, letting of it lie ſpread on their Field-Lands three or four of the Summer-months together, till the Sun and Air hath exhauſted all the vertue thereof; which if it be laid on heaps with Earth mixed therewith, and ſo let lie till it be rotten, it will be the ſooner brought to a convenient temper, and on Paſture-grounds brings a ſweeter Graſs, and goes much farther than the common way, and ſpread before the Plough produces excellent Corn: It is alſo to be uſed with Judgment; for ordinary Dung uſed the common way in ſome years doth hurt, and ſometimes makes Weeds and trumpery to grow, which ordered as before, is not ſo apt for ſuch inconveniences. Of all Beaſts, Sheep yield the beſt Dung, and therefore is moſt to be eſteemed; it is a very high Improvement to the common Field-lands, where there is a good Flock duly folded on them, eſpecially where it is turned in with the Plough ſoon after the fold: the only way to Improve your Sheeps-dung to the higheſt advantage, is to fold them in a covered fold with intermixture of Earth, Sand, *&c.* as before, and by this means we may make our ſheep enrich moſt of our barren Lands. *Of Sheeps-dung.*

Sheeps-dung is very excellent being diſſolved wholly (as it will be if well ſqueezed) to ſteep Grain therein, for the Grain doth very eagerly imbibe the whole quantity of the Dung into it ſelf, except only here and there a treddle undiſſolved, and proves a great Improvement if rightly ordered.

Great quantities of this Dung might be obtained, if poor Women and Children were imployed to pick up the ſame on the Rode-ways, and burning tops of hills, where it ſeldom doth any good, but would prove much more advantageous than the coſt or trouble, by far.

This hath in former Ages been eſteemed the worſt of Dungs, very hurtful to Corn, a breeder of Thiſtles, and other noiſome Weeds. *Of Swines-dung.*

But our late Huſbands (whoſe experience I rather credit than an old vain Tradition) ſay 'tis very rich for Corn or Graſs, or any Land; yea, of ſuch account to many ingenious Huſbands, that they prefer it before any ordinary Manure whatſoever, therefore they make their Hog-yards moſt compleat, with an high Pale paved well with Pibble or Gravel in the bottom, *&c.* they caſt into this yard their Corniſh Muſkings, and all Garbidge, and all Leaves, Roots, Fruits, and Plants out of Gardens, Courts and Yards, and great ſtore of Straw, Fearn, or Weeds for the Swine to make Dung withal; ſome Hog-yards will yield you forty, ſome ſixty, ſome eighty Load of excellent Manure of ten or twelve Swine. *Engliſh Improver.*

It's moſt likely that this Manure ſo made by theſe large additions, is more natural and kindly to Land, than the bare Swines-dung it ſelf; and muſt of neceſſity prove a very high advantage, conſidering the deſpicable vile ſtate of this Beaſt.

Some good Daries will make the Soil of their Hog-yard produce them twenty or thirty pounds worth of profit in a year.

Of the Dung of Fowls.

Of Pigeons-dung. This challengeth the Priority not only of the Dung of Fowl, but of all other Creatures whatsoever.

Pigeons or Hens-dung is incomparable, one Load is worth ten Load of other Dung, and therefore it's usually sown on Wheat (or Barly) that lieth afar off, and not easily to be helped; it's extraordinary likewise on a Hop-garden.

A Load of Pigeons-dung is more worth than twenty shillings in many parts; a very excellent Soil for a cold moist-natured Land.

I have caused it to be sown by hand after the Grain is sown, and in the same manner, and then harrowed in with the Grain, and received a very great increase on poor Land.

I have known (saith *Platt*) a Load of Pigeons-dung fetched sixteen miles, and a Load of Coals given for it, which in the Soil where it was fetched would have done more hurt than good for the Manuring of Land, yet where it was carried, it did as much good for the fertilizing of Land as double the charges: In the one Soil it cured the barrenness, and in the other it poysoned the fertility.

Hen-dung. This Dung is of less esteem, because it is not obtained at so easie a rate; and where it is, it's generally little set by, because our Fore-fathers did not make any great matter of it, and because they understand not the strength and power of it; for when they take it out of the houses it's of a very hot nature, and must needs injure some things, if laid thereon; but if it be mixed well with common Earth, Sand, or such-like, and let lie till it rot well together, you will finde it a very rich Manure, and of value to answer a great part of your Poultreys expence.

I have known a Quince-tree whereon Poultrey always pearched, that by reason of the Rain washing to its Roots the salt and fatness of the Dung, did bear yearly an incredible number of very excellent Quinces.

Of Goose-dung. Markham. This hath been held by the Antients to be most hurtful and unprofitable to any Grounds. They say that to good Grass they are a great enemy, for their Dung and treading will putrifie it, and make it worse than barren.

I have it from a credible hand, that Goose-dung is very advantageous to Corn, it being discovered by a flock of Geese daily passing over-thwart a Field of Wheat, making as it were a Lane over the same in the Winter-time, and had nibbled the Wheat clean from the Ground, and dunged it where they went; in which passage the next year proved to be very gallant Wheat, far exceeding any other part of the Field.

Like unto that I have heard, that a Flock of Wild-geese had pitched upon a parcel of green Wheat, and had eaten it up clean,

and ſat thereon, and dung'd it ſeveral nights, that the Owner deſpaired of having any Crop that year, but the contrary happened; for he had a far richer Stock of Wheat there than any of his Neighbours had in the Land adjoyning, to the admiration of all.

Which demonſtrateth that this Dung is of a very hot and fiery nature, which occaſioneth that barrenneſs falſly ſuggeſted to be in it; and being laid abroad thin in the Winter-time, proves a very rich Manure, and therefore to be eſteemed of; and being mixed with cooling Earths, and let putrifie ſome time, may prove very much for your benefit: therefore neglect it not, but make ſeveral trials, the Advantage will be your own. The ſame may be ſaid of the Dung of any other Water-fowl.

Although that Urines are eſteemed to be of a deſtructive and mortifying nature to Vegetables, as *Glauber* affirms, by reaſon of its *Salarmoniacal* and burning Spirit that is therein, as is evident to our Senſes upon the caſting of new Urine on Nettles or other Vegetables, it ſoon deſtroyeth them: But it is with this, as with many other moiſt things ſubject to putrefaction, time will digeſt it, and alter the nature and property thereof, as it doth Wine or Beer into Vineger, ſo it will of this fiery matter produce an excellent Soil, as many have had the experience of. *Of urines.* Explicatio Miraculi Mundi, p. 50.

Mr. *Hartlib* teſtifieth, that in *Holland* they as carefully preſerve the Cows Urine as the Dung to enrich their Land. *Columella* in his Book of Huſbandry ſaith, *That old Urine is excellent for the Roots of Trees.*

I know a woman (ſaith Mr. *Hartlib*) who lived five miles South of *Canterbury*, who ſaved in a Pail all the Urine; and when the Pail was full, ſprinkled it on her Meadow, which cauſed the Graſs at firſt to look yellow, but after a little time it grew wonderfully.

Another alſo ſaith, That Mans Urine is of great worth, and will fatten Land more than you are aware of, and it were not ill Huſbandry to take all opportunities to preſerve it for Land, and ſo of all other Urines, after the *Dutch* manner. *Engliſh Improver.*

Humane Ordure ought not here to be omitted as a rich Soil, if the Huſbandman would be ſo careful as to place his Houſe of Office, that he may once in two or three days add ſome mixture of Earth, Straw, Stubble, or ſuch-like, to reduce it into a neceſſary Subſtance portable into his Lands or Grounds remote from his Dwelling, where after it hath lain ſome convenient time in a heap to putrifie together, and then thinly diſperſed, proves an unexpected Advantage.

SECT. V.

Of ſeveral other Soyls or Manures.

Aſhes contain in them very much of a rich and fertile Salt, as before we noted, and therefore not ſo much to be ſlighted and neglected as they are, be they of what kinde or nature ſoever. *Aſhes.*

Virgil.

Virgil. —— *Ne pudet,*
Effœtos Cinerem immundum jactare per agros.

The Wood-aſhes are the beſt, and very uſeful; yet after they have been uſed in the Bucking of Clothes, they are worth little, unleſs it be in cold and moiſt Land, where I have known them alſo to avail much.

Sea-coal aſhes with Horſe-dung make an excellent Compoſt for divers uſes.

Turf and Peat-aſhes muſt needs be very rich, being much after the ſame manner as the Burning of Land, which moſt know to be a very great Improvement, and whereof we have already treated.

Aſhes are a great Curer of Moſs and Ruſhes in moſt Grounds.

The Aſhes of any ſort of Vegetables are very profitable, as divers places in *England* can teſtifie by experience, who conſume their Fearn, Stubble, Straw, Heath, Furs, Sedge, Bean-ſtalks, and the very Sward and Swarth of their Ground to aſhes; and theſe according to the ſtore of Salt which their Aſhes do contain, do either for a longer or ſhorter time enrich their barren Grounds.

Mr. *Platt* highly commends Soap-aſhes, after the Soap-boylers have made what uſe of them they pleaſe, to be a very great enriching to Land; and gives you an inſtance of a Stalk and Ear of Barley of an Ell and three Inches in length, that grew on barren Land, enriched with Soap-aſhes; he alſo ſaith he found the like ſucceſs in Paſture-ground.

In *Lombardy* they eſteem them much above other Dung.

It's beſt to lay them either on Corn, or Paſture, or Meadow in the beginning of Winter, that the ſhowers may the eaſier diſſolve them.

Soot. Soot alſo is affirmed by ſome to be very good, eſpecially that which is made of Wood. It's moſt beneficial to Trees or Plants that either grow in the ſhade, or to cold and moiſt Grounds.

Salt. Common Salt may prove advantageous, if uſed with moderation and diſcretion, as well to ſaltiſh Sands, Muds, Earths, *&c.* Some commend very much the ſweeping of a Ship of Salt, or droſſie Salt and Brine.

It is of ſingular uſe, as daily experience teſtifies, being diſſolved and Seed-corn ſteeped therein, to prevent the Smut, and add fertility, as we noted before in the Preparation of the Seed.

There is alſo a relation of one that ſowed a Buſhel of Salt long before on a ſmall patch of barren Ground at *Clapham*, which to that day remained more freſh and green, and full of Swarth, than all the reſt of the Field about it: This, though not a beneficial Experiment, by reaſon of the price of Salt, yet a plain demonſtration of the Fertility that is in Salts, and gives us encouragement to make uſe of the Brines of Salt-pits, or ſuch-like, now not in much eſteem.

Rags. In Rags of all ſorts there is good vertue; they are carried far

and

and laid upon Lands, and have them in a warming, improving temper: one good Load will go as far as a dozen or more of the beſt Cow-dung.

Divers alſo have found ſingular profit in the Hair that is gotten from the Hides of Beaſts, being thinly laid upon the Ground, and ſuffered to putrifie. *Hair, &c.*

Alſo courſe Wool-nippings and Tarry Pitch-marks, may be reckoned into the number, having great virtue in them.

Mault-duſt is commended as an Inricher of barren Lands; but becauſe great quantities are not to be had thereof, it is beſt to be uſed in Gardens, where you will finde it to be of ſingular uſe: only it is apt to breed Weeds. *Mault-duſt.*

All ſorts of Fearn, Straw, Brake, Stubble, Ruſhes, Thiſtles, Leaves of Trees, or any manner of Vegetable Traſh whatever, either caſt into the yards amongſt the Cattle or Swine, or caſt into Pools or places to rot in, or mixed with other Soils, help very much, and make very good Compoſt. *Fearn, Straw, Stubble, &c.*

All Marrow-bones, Fiſh-bones, Horn or ſhavings of Horn, or Liquors wherein Fleſh or Fiſh have lain, or any other thing whatſoever that hath any oylineſs or fatneſs in it, is uſeful in Huſbanding Lands. *Bones, horns, ſtinking fleſh, &c.*

It were not much labour to try whether the bones of Horſes or other Beaſts, whereof there are great quantities at ſome Dog-kennels, which if being burnt in heaps with ſome ſmall addition of Fewel would be of good effect to be laid on Lands.

There is in all Bark a very rich Salt, but in the Oaken-bark the moſt, which is made uſe of principally by *Tanners*; but ſuch Barks or Rinds of Trees not of ſo high a value, being broken into ſmall pieces muſt of neceſſity enrich either Corn or Paſture-ground being laid thereon: It muſt needs be much richer than the Mould or Earth uſually found in the bodies of old, large, and hollow Willow-trees, that are putrified within, which is eſteemed to be ſo rich and effectual. *Bark of Trees.* *Earth in Willow-trees.*

Amongſt the Coal-Mines they uſually dig a kind of blew or black Clay that lies near the Coal, and is as it were an unripe Coal, which the Country-men commonly call *Urry*, which they lay on their Paſtures with wonderful ſucceſs, and is very proper for warm Lands. *Urry.*

CHAP.

CHAP. VI.

Of the Benefit, Raiſing, Planting, and Propagating of all ſorts of Timber-trees, and other Trees uſeful either in Building or other Mechanick Uſes, or for Fencing, Fewel, &c.

SECT. I.

Of the Benefit of Propagating Timber-Trees, and other Trees in general.

THE Propagation of *Woods* or Trees is none of the leaſt Improvements that can be made on moſt of the Lands in *England*, for the particular advantage and pleaſure of the Countryman, and in raiſing the yearly profits of his Farm, and very much advancing the price of the purchaſe thereof over and above the Annual gain: and nothing can render a Seat more delectable and pleaſant than *Wood* and *Water*, but principally the curious *Groves* ſurrounding or bordering near it.

What can be more profitable than *Woods* or *Trees?* which will thrive and increaſe on the moſt barren and unfruitful Land, be it either wet or dry, cold, mountanous, uneven, remote, or never ſo inapt for any other manner of Culture, where neither Corn, Graſs, or any other neceſſary or uſeful Vegetable will hardly grow, yet may we there perceive the lofty Woods flouriſh, far exceeding in value the purchaſe of the Land without them; and inſtead of injuring the Land whereon they ſtand, it is much bettered and capacitated to bear tillage at the removal of the Trees; alſo the other bordering grounds yield a greater encreaſe of Corn or Graſs, by their defence from the extremity of the cold, and bitter blaſts in the Winter, and the ſcorching drought of the Summer.

And what can be more pleaſant than to have the bounds and limits of your own Propriety preſerved, and continued from age to age by the Teſtimony of ſuch living and growing witneſſes, in the Spring yielding a reviving Cordial to your Winter-chilled ſpirit, giving you an aſſurance of the approaching Summer by their pregnant Buds, and Muſical Inhabitants? In the Summer what more delectable than the curious proſpect of the variety of Greenneſs, dark ſhades, and retirement from the ſcorching Sunbeams? The Autumn and Winter alſo not without pleaſure and content for the active Huſbandman.

And

And what place can be more displeasing and ungrateful than a naked and dry Seat, lying open to all Winds and Weathers? of which it may be said as once of old *Sarum*:

Est ibi defectus Lymphæ, sed copia Cretæ;
Sævit ibi Ventus, sed Philomela silet.

As for the more particular advantages and benefits of planting Woods and Trees, you shall find that, *Particular Advantages.*

First, It improves and meliorates the Land it self; for those Lands where Woods have formerly stood, and are now grubbed up or taken away, the ground is very good and rich, and bears excellent Corn, or any other Tillage or Grass, although the ground was before the planting or growing of those Woods barren, lean, and thin, as may appear by the bordering Land on either side of such Woods that were never planted.

Secondly, The Annual profits of most Land planted with Coppice-woods are much greater than if the same Land were used for Corn, Grass, or such-like: For I have known on a hill, Land not worth for Corn or Grass above five shillings *per* Acre, that at twelve years growth the Coppice-wood thereon growing hath been sold at the rate of twenty pounds *per* Acre; and at the next felling at seven years growth it is like to be of the same value, it coming much thicker, and being better preserved than at the first, which is a very considerable advance of the value or profits; besides, it is not subject to those casualties and hazards that Corn, Cattle, *&c.* are subject unto: It will also bring in an Annual profit if you divide your Coppice into so many parts as you intend it shall stand years before it be felled, then may you every year fell a part: as if you have ten Acres, you may every year fell one Acre at ten years growth.

The better and lighter your Land is, the greater will your encrease be, which may in some sort (if the Land be very good) make good the Improvement: Mr. *Blyth* instances in his *Improver Improved*, of a new Plantation that at eleven years growth a fall was made, and so much Wood cut upon the same as was worth or sold for sixty pounds *per* Acre or more; it was much Pole-wood, yea a good part of it made Spars, and some part of it small Building Timber, *&c.* the Land was worth about ten shillings *per* Acre, digged and planted with Quicksets.

The same Author also gives very great encouragement for the planting of Poplar, Willow, and Alder, on wet, morish, or boggy Land, to the advancement of Land not worth two shillings an Acre, unto five pounds an Acre at seven years growth, which is the least I am confident, if it be carefully ordered.

Thirdly, The Benefit and Advantage is very great that is raised from Timber and other Trees standing singly, and in Hedge-rows, Avenues, or any other way disposed or ordered about your Houses, Lands, Commons, *&c.* that a man may plant, and in a few years himself or his successors may reap the benefit.

Mr. *Blith* gives you an inſtance of one that planted one hundred *Aſhes*, and at the end of fifty years ſold them for five hundred pounds: And of another that planted ſo much Wood in his own life, that he would not take 50000 *l.* for.

For Aſh, Elm, Poplar, Willow, and ſuch Trees that are quick of growth, it is a very great profit that is made of them where Fewel is ſcarce, by planting them in Hedge-rows, and other ſpare places, and ſhrouding them at five, ſix, eight or ten years growth: they conſtantly bear a good head, and every time whileſt the Tree is in proof, the ſhrowds encreaſe. They are out of the danger of the bite of Cattle, and require no Fence.

Fourthly, Another main Benefit accrews to the induſtrious Huſbandman from the Propagation of Trees in Hedge-rows, and Out-bounds of his Lands, it gives a check to the fierce cold Winter-blaſts which nip the Winter-Corn, and finely refrigerates the Air in the Summer-parching Heats, and qualifies the dry and injurious Winds both in Spring and Summer. Let the Champion-Farmers object what they pleaſe, there's no Field Champion-Land of that yearly value for either Corn or Paſture, as is the Wood-land: I know no other reaſon for it than the natural warmth and defence thereof by the Fences and Trees, elſe why ſhould an Enclоſed and well-planted piece of Several yield ſo much more certain Rent than the Land of the like nature in Common and Open, lying but on the other ſide of the Hedge obvious to the injurious Airs, although both converted to the ſame uſe?

Fifthly, Trees planted *ſparſim* here and there in the Hedge-rows, and other places of your Land, prove an excellent ſhelter for Cattle in the Winter, to preſerve them from cold Storms and Winds, and alſo in the Summer from the ſcorching Sun-beams, elſe would the Cattle deſtroy more with their Feet than they eat with their mouths, and loſe more fatneſs in one hot day than they gain in three cool days.

More univerſal Advantages.

Theſe univerſal Advantages alſo accrew to thoſe Places or Countries well planted with Woods and Timber.

Firſt, There is a conſtant ſupply of Timber for the Building of Ships, the Bulwarks and Defence of this *Nation*, and for the re-edifying of Towns or Houſes deſtroyed by Fire, or other Caſualties; and for the Building, Maintaining of, and Repairing of all Houſes, Barns, and other Edifices. And alſo it yieldeth us a continual Recruit of neceſſary Boots, Inſtruments and Materials for all our Rural and Mechanick uſes; as for our Mills, Carts, Ploughs, *&c.* and for Turners, Joyners, and other Wooden Trades; alſo for the maintenance of the Grooves or Pits of Lead, Coal, and other Mines under the Earth, that where plenty of Woods and Trees are, they need not be enforced to fetch theſe Materials afar off, at a great expence and labor. In ſome places they fetch moſt of the Neceſſaries aforeſaid near twenty miles on Horſback, when the Land at the ſame place where they need it, as is capable of bearing it as the place from whence they bring it.

Secondly, Where Woods are raiſed and maintained, there is a conſtant

conſtant Supply of Fewel. The difference may be very eaſily diſcerned between the *Woodlands* and the *Champion*; in the one you have Fewel in every houſe, as well poor as rich, of good Wood; in the other, the Rich have but little, and that at extraordinary Rates, and the poor none but what they filch and ſteal from the Rich; or if their honeſty exceed their neceſſity, they either ſit and ſtarve with cold, or burn Stubble of Corn or Cow-dung dried, or the Parings of the Earth, or ſuch-like, that the other make uſe of for the Improvement and Manuring their Land.

Thirdly, The Tanners Trade depends upon the Oaken-Trees, therefore where they are ſcarce, there muſt of neceſſity be a defect of that Occupation, which muſt in fine prove prejudicial to the whole Nation.

Fourthly, Where Beech, Oak, Haſel, and ſuch-like Maſt-bearing Trees are in any conſiderable quantity ſtanding, they yield a very good Food for Swine, of no ſmall value to the Huſbandman in ſuch years they take.

I ſhall therefore give you a brief *Catalogue* of ſuch Trees as uſually flouriſh in our Engliſh Soil; the places they moſt delight in, the moſt natural and likely way of Propagation, and their uſes, and what other Obſervations we have met withal concern them. And firſt,

SECT. II.

Of Timber-trees in particular.

The Oak. There is no Timber natural to our Engliſh Soil exceeds the Oak, for its Plenty, Strength, and Durableneſs; Where are better or ſtronger Ships for the War, than thoſe built of Oak? And what Timber more laſting or ſtronger than Oak in our Rural Edifices? It is a Tree univerſally known, and will grow and proſper in any Land, good or bad, Clay, Gravel, Sand, or mixed; warm, cold, dry or moiſt, as experimentally appears by its growth in ſeveral *Place.* places of contrary natures or tempers; but they do moſt affect the ſound, black, deep, and faſt Mould, rather warm than overwet and cold, and a little riſing, for this produces the firmeſt Timber; although I have known them thrive very well in extraordinary cold, moiſt, and clay-ground, that a Tun of Timber could not be thence haled unleſs in the dry and Summer-ſeaſon, but that the Wheels would ſink in the Clay to the Axle-tree. They will alſo grow, though but ſlowly, on the high, ſtony, and barren Hills.

Propagation. The Acorns, or Oaken-Maſt, being ſown in your Nurſery, after they are full ripe, and before they are withered (which will quickly be if they lie open in the Air) will the next Spring yield you plenty of young Plants, which you may order and tranſplant, as hereafter in the *Nurſery* you ſhall have Directions.

Or for expedition-ſake, you may have young Sets drawn by thoſe that ſeek the Woods for Quick-ſets, in ſuch places where Acorns have ſpontaneouſly grown, and been ſheltered from Cattle till they

are fit for a remove; but these prove generally crooked and ill-shaped, and so are to be cut near to the ground when you plant them, by which means they will emit another shoot more streight.

Oaks also prosper very well in Coppices, being felled as other Under-woods are. It is reported that a Lady in *Northamptonshire* sowed Acorns, and lived to cut the Trees produced from them twice in two and twenty years, and both as well grown as most are in sixteen or eighteen. Also that Acorns set in Hedge-rows, have in thirty years born a Stem of a Foot Diameter.

Use. The several uses of Oaken Timber for Buildings, and other Mechanick uses is so universally known, that it is but needless to enumerate them. To abide all seasons of the weather, there is no Wood comparable unto it, as for Pales, Shingles, Posts, Rails, Boards, *&c.*

For Water-works also it is second to none, especially where it lies obvious to the Air as well as the Water, there is no Wood like it: For Fewel either as it is, or made into Cha-coal, there is no Wood equals it.

The Bark also for the Tanner and Dyer, exceeds all other Barks: the very Saw-dust and ashes also of the Oak challenge a preference, the Mast exceeds any other Mast of the Forrest-trees, and is of great use to the Husbandman in fatting Swine; for in the Forrests and great Woods many herds of Swine are very well fatted in such years that the Oak yields plenty of Mast; and that Bacon so fed (especially if the Swine are kept up with Pease some time after) is the most delicious meat; for the Hams we have from *Westphalia* and other parts of *Germany* under that name, are of those Swine that feed on this Mast: for their exercise they of necessity use in searching for these Acorns, as well as the natural sweetness of the Fruit it self, very much melioratеth the flesh of these Animals, as it doth of Deer, Hares, Conies, Pheasants, Ducks and many others, the flesh of them that are wild being by much to be preferred to the tame.

The young Boughs of the lopped Oak in the Spring-time are of equal use to the Tanner, as is the Bark of this Tree, as hath been found by the experience of many Tanners of this Nation within these few years.

The Elm. The Elm is one of the most easie Trees to propagate, and delighting in most sorts of ground, except only Land very dry, hot and parching, shallow Land near Chalk or Gravel; on the tops of Hills it thrives not well, yet it will grow almost in any place.

But the places it principally delights in, is the level, light, and loose Land, so that it be moist; on the Banks of such level and fertile grounds, whether they be of Gravel, Earth, or Chalk, the Elm prospers well.

Propagation. About the beginning of *March* fall the seeds of the Elm, which being sown in your Nursery, will yield you Plants. But the care and trouble thereof is superfluous, seeing there are newer and more expeditious and advantageous ways known, *viz.* by the Suckers.

Which

Which are produced in great plenty from the roots of the Elm, and may be tranſplanted into any places: where the Elms grow, great plenty of theſe Suckers will yearly ſhoot out of the Earth if Cattle be kept from them; or if any Elm be felled, the old Roots will yield plenty of Suckers; or if the old Roots be chopped or ſlit, and ſlightly covered with light mould, they will ſend forth plenty of Suckers, all which may be ſlipped off, and tranſplanted even unto any bigneſs; there being no Tree more eaſily tranſplanted and with good ſucceſs than the Elm, obſerving theſe Cautions, that if you remove them very young, that you cut not off the top, becauſe it is ſappy, and the wet will be apt to get in and decay the Plant, being weakened by his removal; but the greater you muſt be ſure to diſbranch, leaving only the ſtem; ſome cover alſo the head of ſuch Elm ſo cut off with a mixture of Clay and Horſe-dung.

I have been very credibly informed, that a certain Gentleman in the North-Country having a deſire to raiſe ſuddenly a Plump or Grove of Trees about his Manſion-houſe, there being a great ſcarcity of Wood in that place, obtained a parcel of Elm-trees, lops and tops, and made Trenches or Ditches in the Earth, and cut his Elm-branches, *&c.* into ſeveral lengths of ſix, eight, ten, or twenty feet in length, as with beſt conveniencie he could, and buried them ſingly in the Trenches ſo digged, and covered them wholly from the one end to the other, leaving only a hole open about the middle of the interred branch; or if it were a long piece, then two open places might be left, out of which places did ſpring forth ſeveral ſhoots the firſt year of a very great length; the Winter ſucceeding he took theſe branches or ſhoots, all, ſave only the faireſt, and which was moſt probable and likely to thrive, and ſo filled up the hole about it, by which means they grew to a prodigious height in a few years, that his habitation was compleatly adorned with living aſpiring products of his ingenious attempt. Note, that the true time of this *Sepulture* is when the ſap is full in the Tree, when the Leaves are newly ſprung, for then the great quantity of the ſap that is in the whole branch forceth it ſelf into thoſe ſhoots or Cions that then have found a paſſage; alſo for the ſucceeding yeers the whole Tree in the Earth becomes a main principal nouriſhing Root to the nimble growing Tree. For it is evident, that if an Elm be felled in the Spring-time when the ſap is up, that then the Tree lying on the ground will ſpend much of its ſap in ſmall ſhoots in every part of it. Much rather if ſuch Tree were buried in a good moiſt Soil, with only one part thereof open to the Air, from which part you expect a flouriſhing ſhoot to proceed. Some have with good ſucceſs buried ſuch Elm-branches about the end of *January* or beginning of *March*; but if the Land be not over-dry, the later is better.

If the Elm be felled between *November* and *February*, it will *ut.* be all Spine or Heart, or very little ſap, and is of moſt ſingular uſe in the Water where it lies always wet, and alſo where it may always

always dry; it is alſo a timber of great uſe for its toughneſs, and therefore uſed by Wheel-wrights, Mill-wrights, *&c.* It is alſo good to make Dreſſers, and Planks to chop on, becauſe it will not break away in chips like other Timber.

The Elm is good Fewel, and makes very good Charcoal; the Branches and Leaves of this Tree are good food for Cattle; in the Winter where other fodder is dear, they will eat them before Oats.

The Elm is alſo a moſt pleaſant Tree to Plant in Avenues or Walks, it growing ſo ſtreight and upright, and mounts to the greateſt height of any other Tree in ſo ſhort a ſpace: It will grow the neareſt of any other together, being very ſociable, and affecting to grow in company, and ſpreads its Branches but little to the offence of Corn or Paſture-grounds; to both which and the Cattle it affords a benign Shade, Defence, and agreeable Ornament.

This Tree is alſo very flexible, and to be reduced into what form or ſhape you pleaſe for ſhade and delight; it alſo ſprings earlier than moſt other Forreſt-trees.

The Beech. This Tree commonly grows to a great ſtature, delights moſt in warm Land, it grows plentifully in Gravelly, Stony, and ſandy Land: great Beechen-woods I have ſeen on the drieſt barren ſandy Lands; they delight on the ſides and tops of high Hills, and chalky Mountains; they will ſtrangely inſinuate their Roots into the bowels of thoſe ſeemingly impenetrable places.

This Tree is altogether a ſtranger to moſt Counties in *England*. And it is probable that there might be none here when the Great *Cæſar* denied that he found any. For many of thoſe great Woods of Beeches may have ſprung up after the felling of Oak; as it hath been obſerved of late years, that where Oak hath been felled the Beech hath ſucceeded, and that not only here and there a Tree, but in many Acres, and alſo where no Beech hath been near unto the place. *Sponte ſua veniunt.* Some places naturally produce them.

If the *Species* of Trees may be wholly extinct, as is reported of the *Cheſnut*, at leaſt from a ſpontaneous growth; why may not aſwel a new *Species* naturally ſucceed? As the *Elm*, which is reported to be no antient product of our Engliſh Soil.

Propagation. This is raiſed from the Maſt as the Oak, and from young Plants drawn by the Quickſet-gatherers, and planted as the Oak; it grows but ſlow whileſt it is young, but when the Beech is gotten a little out of the way, no Tree thrives better, nor ſooner attains to a large bulk than this Tree; and although it be crooked, knotty, and ill-ſhapen whileſt it is young, yet will it overcome all thoſe, and prove a ſtreight and compleat Tree.

Uſe. Its uſe is principally for the Turner, Joyner, Upholſterer, and ſuch-like Mechanick Occupations, the Wood being of a clean, white, and fine Grain, and not apt to rend or ſlit: it is ſometimes uſed in building: It is alſo very good Fewel, burning clear and light, and makes good Charcoal, though not long-laſting: the

Maſt

Maſt feeds Swine, Deer, Pheaſants, *&c.* The Wood of this Tree will be cut by an Inſtrument made for that purpoſe, into thin and broad Leaves, wherewith they make Band-boxes, Hat-caſes, *&c.* being covered with Paper; this they now do in *London*, though formerly ſent into other Countries for that purpoſe.

That it is a Tree of great uſe in Mechanicks, witneſs the vaſt quantities that are in *Hampſhire* and ſome adjacent places, converted into Turners-ware, and weekly ſent to *London*. Many of the Inſtruments uſed aboard-ſhip are made of this Timber.

This Tree planted in Avenues or Walks yield a moſt delectable and agreeable ſhadow all the Summer, few or none exceeding it for colour and ſhade.

The Leaves alſo gathered about the Fall, and ſomewhat before they are much froſt-bitten, afford the beſt and eaſieſt Mattreſſes in the world to lay under our Quilts inſtead of Straw, and continue ſweet for ſeven or eight years.

The Aſh.

The Aſh is a gallant quick-thriving Wood, it delights in the beſt Land, and will prove well in almoſt any ſort of Land whatſoever, and will alſo grow in the hard, barren, mountanous Land, but not ſo well for Timber, as in Coppice-woods. Pollards ſhrowded or lopped, refuſe no place. The beſt Aſh grows in the beſt Land; yet is it not convenient to plant them near Ploughlands, for the Roots hinder the Coulter, and exhauſt the fertility of the Soil; the dripping alſo is injurious to Corn.

There is no Tree delights more, nor is more beneficial in the Chalk or White Land than the Aſh; for on thoſe white Hills in *Wiltſhire*, *Hampſhire*, &c. that Tree thrives exceeding well, and being ſown in the Keys there, would in time prove a very conſiderable advantage aſwel to the private as publike.

Propagation.

It is propagated from the Seed or Keys, which being gathered in *October* or after, when they begin to fall, and ſown in your Nurſery, the next Spring come twelvemonth they will appear, and will afterwards thrive and proſper very well: they are to be removed whileſt they are ſmall, becauſe of their ſpeedy deep rooting. Take not off the tops of the ſmall young Aſh, becauſe it is a ſappy plant; but of the greater Sets it's beſt to cut them near the ground, and then will they ſend forth new ſhoots, which will ſoon ſupply the defect of the other; which may alſo be done in all young Aſh after they are well ſettled, and it will cauſe to ſhoot large and thriving ſhoots: I have ſeen the experience of it in ſuch plants that ſtood ſeveral years, and every year decayed till cut off at the roots, and then they did wonderfully thrive.

You may alſo have Plants drawn by thoſe that draw Quick-ſets, *&c.*

When you intend to raiſe this Tree on hills or in open grounds, the beſt way is to ſowe the Seeds in the place before or after the Plough; if in Copſes where the Plough cannot paſs, then to prick them in amongſt the Rides of Haſel or other ſtuff, which will defend this Plant from the bite of Cattle; ſo that amongſt the infinite numbers that thus you may cauſe to be interred, in a few

years

years you may obſerve many fair Trees to ſteal up amongſt the Underwood, which you may preſerve.

Uſe. The uſe of the Aſh is almoſt univerſal, good for Building or any other uſe where it may lie dry, ſerves the occaſions of the Carpenter, Plow-right, Wheel-wright, Cart-wright, Cooper, Turner, *&c.* For Garden-uſes alſo no Wood exceeds it, as for Ladders, Hop-poles, Paliſade-hedges, and all manner of Utenſils for the Gardiner or Huſbandman. It ſerves alſo at Sea for Oars, Handſpikes, *&c.* and is preferred before any other.

There is not any Wood ſo ſweet for Cattle to brouſe on as this: Rangers and Keepers of Parks in hard Winters have the experience of it, by brouſing their Deer on it, and prefer it before any other. Every Country-man alſo hath the experience of it, by feeding of Cattle on the fallen Hedges, where the Aſhen-boughs are firſt chewed even to admiration before any other by the tender-mouth'd Heifer.

For Firing there's no Wood comparable to it, for a light ſweet burning; it will alſo burn better newly cut than any other Wood.

The only ſeaſon for ſetting the Aſh for uſe, is from *November* till the end of *January*; for if the ſap be never ſo little in the Tree, the Worm takes it, and ſpoils the Wood in a ſhort time.

There is no Timber of ſo ſpeedy a growth as the Aſh, that it is related that an Aſh at forty years growth from the Key, hath been ſold for thirty pounds. Mr. *Blith* alſo inſerts a Preſident of a Nurſery of young Aſh that were caſually ſown by the Wind, that ſpeedily returned to the owner a very great advantage.

Of the Walnut-tree. Becauſe this Tree is more generally planted for the ſake of the Fruit than the Timber, we ſhall refer it to the Chapter of Fruit-trees; only let you know, that the Timber of the Walnut-tree is of ſo great uſe and benefit, that it's encouragement ſufficient for the propagation thereof; the fruit then added makes the encouragement the greater.

This Timber is of univerſal uſe (unleſs for outward Edifices) none better for the Joyner, Upholſterer, Gunſmith, Cabinet-maker, and other Occupations; of a more curious brown colour than the Beech or other Woods, and not ſo obnoxious to the Worm.

Of the Cheſnut-tree. They delight in a light ground or moiſt gravel, and will grow in Clay, Sand, and all mixed Soils, upon expoſed and bleak places, as more patient of cold than heat.

Propagation. They are raiſed from the Nuts, thus: Firſt, ſpread them to ſweat, then cover them in Sand; a month being paſt plunge them in Water, and reject thoſe that ſwim; being dried, for thirty days more Sand them again, and plunge them as before; keep them in Sand till the beginning of the Spring, and ſet them in your Nurſery, but they thrive beſt unremoved; you may alſo ſet them in *Winter* or *Autumn* in or without their huſks, and ſowe them with other Maſt for the raiſing of Coppices.

Uſe. The Cheſnut-tree growing in Coppices yields incomparable Poles for the Garden or Hop-yard: If it like the Ground it will in

ten

ten or twelve years time grow to a kinde of Timber, and bear plentiful Fruit. The Timber whereof is (next the Oak) one of the moſt-ſought after by the Carpenter and Joyner, and is of very long laſting, as appears by many Antient Houſes and Barns built thereof about *Graveſend* in *Kent*.

Being planted in Hedge-rows, or for Avenues to our Country-houſes, they are a magnificent and royal Ornament; and although our Engliſhmen delight not ſo much in the Fruit of the Cheſnut-tree as other Nations, yet will they yield no ſmall advantage to ſupply our other occaſions.

The Service-tree.

This Tree delights in reaſonable good ground, rather inclining to cold than over-hot, for in places that are too dry they never bear kindly.

Propagation.

They are raiſed from the Berries, which being ripe may be ſown as other Maſt: theſe will come ſoon to be Trees, and being planted young thrive exceedingly; the beſt and ſpeedieſt way is to encreaſe them from Suckers or Sets.

uſe.

The Timber is uſeful for the Joyner, and being of a very delicate Grain, is fit for divers Curioſities: It alſo yieldeth beams of a conſiderable bigneſs for Building.

The ſhade is beautiful for Walks, and the Fruit not unpleaſant.

SECT. III.

Of ſeveral other Trees not ſo generally made uſe of for Timber, as for Fewel, Coppice-woods, Hedge-rows, &c.

The Birch.

The Birch will grow on any Land, and cannot well be too barren; it will thrive on the hot burning Sand, in the cold wet Clay, Marſhes, Bogs, and Stony places, no place comes amiſs to it.

Propagation.

The Birch is altogether produced of Suckers, which being planted at four or five feet interval, will ſuddenly riſe to Trees; after the firſt year you may cut them within an inch of the ground, and they will ſhoot out very ſtrongly.

uſe.

It is uſeful for the Turner, and for ſome Ruſtick Utenſils: It makes good Fewel, and Charcoal both great and ſmall.

This tree yields the beſt Sap of any Tree in *England*, and the moſt in quantity, prepared either with Honey or Sugar into a Wine; which being now frequently made, hath obtained the name of *Birch-wine*, being a very pleaſant and innocent Liquor, and retaineth a very fine flavour of the Tree it came from.

Where this Tree plentifully grows, great quantities of this Liquor may be extracted, by cutting off ſome ſmall branches, and hanging of Bottles, with the ends of the Branches in the mouths of the Bottles, into which the Chryſtalline Liquor will diſtil: ſeveral Bottles may thus hang on one Tree; or by boring or cutting any part of the ſtem of the Tree, and by a Chip or the like,

to guide the Sap into the neck of the Bottle: By either of which ways great quantities of this Liquor may be extracted in the month of *February* or beginning of *March* when the Sap ascends, and before the Spring of the Leaf; it will run freely when the Wind is South or West, or the Sun shine warm, but not so if the weather be very cold, or in the night-time. Some have reported that a Birch-tree will yield in 12 or 14 days its own weight in this Liquor; I shall not perswade any man to believe it, although it be most evident that a few Trees will yield you a great quantity of it.

This Liquor thus extracted and duly prepared, makes a very delicate repast.

The Maple. The Maple affects a sound and dry Mould, growing both in Woods and Hedge-rows.

Propagation. It is propagated of the Keys, as the Ash.

The Timber is excellent for the Turner and joyner, for its whiteness, its lightness, and fine diapred knots, *&c.*

The Horn-beam. This Tree chiefly desires to grow in cold hills, and in the barren, and most exposed parts of Woods.

Propagation. The most expeditious way of raising it, is by Sets of about an inch Diameter, and cut within half a foot of the Earth; it may also be raised of the Seeds sown in *October*, which are ripe in *August*.

use: It is a very hard Wood for the Mill-wright, for Domestique, or Rural Utensils where hardness is required.

Being planted at half a yard interval in a single row, it makes a stately Hedge or Walk in a Garden or Park, growing tall and speedy, leaved to the very foot of the stem.

The Quick-beam. It delights in Mountains and Woods, and to fix it self in good light ground.

Propagation and use. The Sets may be planted as the Ash, or the Berries ripe in *October* may be sown; It is a quick-growing Coppice-wood, is good for some ordinary uses, and for Fewel.

The Hasel. This Tree above all affects cold, barren, dry and sandy grounds, also Mountains and Rocky Soils produce them; but more prosperously in the fresher bottoms and sides of hills, and in Hedge-rows.

Propagation. They are best raised from the Nut, preserved moist, not mouldy, by laying them in their own dry leaves or in sand, and sown about the latter end of *February*: They are also propagated of Sets and Suckers, the young wands by no means to be cut the first year, but the Spring following, within three or four inches of the ground; greater Sets may be cut within six inches of the Earth the first year.

use; The use of Hasel-Poles and Rods is generally known to the Husbandman, besides for Fewel and Charcoal.

It is the only Plant for the *Virgula Divina*, for the Discovery of *Mines*.

It is a good Ornament for Walks, and yields a pleasant Fruit, but

but why ſhould we bring this ſo near us, when we have a much more excellent Plant at as eaſie a rate? *viz.* the Filbert.

SECT. IV.

Of Aquaticks, or Trees affecting Moiſt and Watry places.

The white Poplar delights in moiſt grounds, and near the *Margins* of Rivers, but not in the Water as the Willow doth. *The Poplar.*

They are uſually encreaſed by the ſtreght branches or pitchers ſet in the ground, but by no means cut off the top until they have ſtood two or three years, and then head them at eight, ten, or fifteen foot high or more, and they will yield in a few years a very conſiderable ſhrowd, which ſhrowds or branches may alſo be tranſplanted; you may alſo let them grow upright without topping them, they are then more Ornamental, but not ſo beneficial. *Propagation.*

Its White Wood is of ſingular uſe for the Turner, and alſo for ſeveral Ruſtick Utenſils, and for the Gardiner: It makes alſo Fewel for the fire. *Uſe.*

This Tree little differs from the Poplar, only it will grow not only in moiſt but in dry grounds, in Coppices, *&c.* is propagated by Suckers, but cut not off the tops of the young Cions the firſt year: its uſe the ſame with the Poplar. *The Aſpen.*

The Abele-tree is a finer kinde of white Poplar, and is beſt propagated of ſlips from the roots; they will likewiſe grow of layers and cuttings. *The Abele.*

In three years they will come to an incredible altitude; in twelve years be as big as your middle; and in eighteen or twenty arrive to full perfection.

This Plant of all other is the moſt faithful lover of Watery and boggy places. *The Alder.*

They are propagated of *Truncheons*, and will come of Seeds; but beſt of roots being ſet as big as the ſmall of ones leg, and in length about two foot; if you plant ſmaller Sets, cut them not till they have ſtood ſeveral years. They are a very great Improvement to moiſt and boggy Land. *Propagation.*

The greater Alders are good for uſes under the Water, where it will harden like a very ſtone, but rots immediately where it is ſometimes wet and ſometimes dry: the Wood is fit for the Turner, and ſeveral Mechanick uſes; the Poles, and alſo the Bark, are very uſeful. *Uſe.*

The Withy is a large Tree, and fit to be planted on high banks, becauſe they extend their Roots deeper than either Sallies or Willows. *The Withy.*

Sallies grow much faſter if they are planted within the reach of the Water, or in a very mooriſh ground, and are an extraordinary Improvement. *The Sally.*

They are ſmaller than the Sallies, and ſhorter lived, and require conſtant moiſture. *Oſiers.*

Willow. The Common Willow delights in *Meads*, and Ditch-sides, not over-wet.

They may all be planted by Pitchers, as the *Poplar:* those Sets or Pitchers are to be preferred that grow neareſt to the ſtock, they ſhould be planted in the firſt fair weather in *February*, and ſo till they bud; the Oſiers may alſo be planted of ſlips of two or three years growth, a foot deep, and half a yard in length, in Moorish ground, *&c.* The Willow may be planted of ſtakes as big as ones leg, and five or ſix foot long.

Uſe and benefit. Theſe Aquatick Trees yield a clean white Wood, fit for many uſes, like unto the Poplar; they alſo yield Poles, Binders, *&c.* for the Gardiners uſe: the Oſier is of great uſe to the Baſket-maker, Gardiner, Fiſherman, *&c.* They are all good Fewel, and make good Charcoal, they are a very great Improvement to Moorish and wet Lands; an Acre at eleven or twelve years growth may yield you near an hundred load of Wood: no Tree more profitable than ſome of theſe Aquaticks (according to the nature of the place) to be planted upon the edges of Rivers, and on Banks, Bounds, or Borders of Meads or wet Lands; they yield a conſiderable head, and ready for ſhrowding in a few years. Mr. *Evelin* relates that a Gentleman lopped no leſs than two thouſand yearly, all of his own planting.

SECT. V.

Of other Trees uſually planted for Ornament, or adorning Gardens, Avenues, Parks, and other places adjoyning to your Manſion-houſe, and convertible alſo to ſeveral uſes.

The Sycamore. This Tree is a kind of Maple, and delights in a good light Garden-mould, and will alſo thrive in any indifferent Land, but rather in moiſt than dry.

Its propagation and uſe. It's propagated of the Keys, which being ſown when they are ripe, and falling from the Trees, come up plentifully the next Spring, and is a Tree of ſpeedy growth. Sets alſo cut from the Tree will grow ſet in moiſt ground, or watered well in the Summer; they afford a curious dark and pleaſant ſhadow, yield a good Fewel, and the Timber fit for ſeveral Mechanick uſes.

The Lime-tree. Propagation. The Lime-tree delights in a good rich Garden-Soil, and thrives not in a dry hungry cold Land. It is raiſed from Suckers as the Elm, or from Seeds, or Berries, which in the *Autumn* drop from the Trees.

We have a ſort of *Tilia* that grows wild here in *England*, which almoſt equals thoſe brought out of *Holland*, where there are Nurſeries to raiſe them ſtreight and comely.

Uſe. This Tree is of all other the moſt proper and beautiful for Walks, as producing an upright *Body*, ſmooth and even *Bark*, ample *Leaf*, ſweet *Bloſſom*, and a goodly ſhade at the diſtance of

Sylva. eighteen

eighteen or twenty foot, their heads topped at about six or eight foot high: but if they are suffered to mount without check, they become a very streight and tall Tree in a little time, especially if they grow near together, they afford a very pleasant dark shade, and perfume the Air in the months of *June* and *July* with their fragrant blossom, and entertain a melodious Army of Bees, from the top of the morning, till the cool and dark evening compels their return. No Tree more uniform both in its height and spreading breadth.

I have known excellent Ladders made of Lime-tree Poles of a very great length; the Wood may also serve for several Mechanick uses, like unto the other soft and Aquatick Woods.

The Horse Chesnut-tree.

This most excellent Tree delights in a rich Garden mould, or other light mould not too dry, and is easily propagated by Layers: It's a quick-growing Tree, most pleasant to the eye at the Spring, when its clammy Turpentine buds break forth into curious divided hanging Leaves; it bears a cluster of beautiful Flowers, and prospers well in our cold Country, and therefore worthy to be taken into our most pleasant Gardens, Avenues, Parks, and other places of delight and pleasure.

Its propagation and use.

The Fir, Pine, Pinaster, and Pitch-tree.

They delight in cold, high, and rocky Mountains, where they naturally grow in great abundance, yet will they grow in better and warmer, but not in over-rich and pinguid; if you plant them you must be careful at first to preserve them moist; therefore Land over-hot, Sandy, or Gravelly, is not so good.

Propagation.

They are all raised of the Kernels taken out of the Clogs, which being laid in Water some days, and then exposed to some gentle warmth of the fire, will open, that you get the Seeds out with much facility, which may be sown in your Nursery, or rather where you intend they should grow, especially the Pine, which will hardly bear a remove unless very young; the Firs will very easily, and may also be propagated of slips, as I have been credibly informed.

use.

The Fir grows tall, streight, and neatly tapering, therefore more uniform for Walks, &c. but the Pinaster bears the proudest and stateliest branches, with a fairer and more beautiful Leaf: these two excel the rest for any Ornamental use, and are sooner mounted, growing in a few years to a very great height. Mr. *Evelin* gives you the relation of one that shot no less than sixty foot in height in little more than twenty years: I have seen Presidents of the like nature. For the first half dozen years they make no considerable advance, but afterwards they come away miraculously.

The use of this Timber is so well known to our Ship-wrights, Carpenters, and other Mechanicks inhabiting near the Maritime Coasts, that nothing here need be said.

Out of these Trees are made Turpentine, Rosin, Tar, and Pitch.

The Larch, Platanus, and Lotus.

These Trees are not much in use, yet deserve to be propagated for their rarity, excellent shade, and durable Timber.

This

The Cypreſs. This curious Tree delights in a warm and dry Land, not ſo much deſiring a rich as a warm place.

Propagation and uſe. It is propagated from the ſeed ſown in *March*, and eaſily abides tranſplantation.

It is one of the moſt Ornamental Plants nature affords, and may either ſtand ſingle, Pyramid-like, or ſet in Hedges, and clipped to any form you pleaſe: we have ſo little of its Timber here, that we only refer you to the Joyner and Cabinet-maker for its uſe.

Cidar. This Tree grows in all extremes; in the moiſt *Barbado's*, the hot *Bermudas*, the cold *New-England*, in the Bogs of *America*, in the Mountains of *Aſia*.

It is propagated of the Seeds; is a beautiful Tree: its Timber incomparable, and almoſt perpetual.

The Alaternus. The Alaternus thrives very well in *England*, as if it were natural; is raiſed from Seeds, is ſwift of growth, and one of the moſt beautiful and uſeful of Hedges and Verdure in the world, and yields an early honey-breathing Bloſſom.

The Phillyrea. This Tree delights in a warm fertile Soil, and is propagated of the Berries or Seeds ſown in the Spring, and alſo of the ſlips ſet like the ſlips of Box.

It is a moſt beautiful Plant, and one of the quickeſt growth of any, for the raiſing of *Eſpalier* Hedges, and covering of *Arbors*, being always of incomparable Verdure.

The Bay-tree. This Tree greatly loves the ſhade, yet thrives well in our hotteſt Gravel.

They are raiſed of their Suckers, and their Seeds gathered when they are through ripe, in the midſt of Winter, and ſown in *March*.

The beauty and uſe of this Tree is commonly known.

The Laurel. This Tree preſerves its Verdure beſt in the ſhade, but grows any where, is propagated like the Bay, and is one of the moſt proper and Ornamental Trees for Walks and Avenues, of any growing.

The Engh-tree: It grows generally in the barrenneſt grounds, and coldeſt of our Mountains, is eaſily produced of the Seeds, waſhed and cleanſed from their Mucilage, and buried in the ground like Haws: it will be the ſecond year ere they peep, and then they riſe with their caps on their heads; at three years old you may tranſplant them; they are alſo propagated by Plants or Suckers, but they are difficult of growth.

The Timber is a very hard wood, and very uſeful to moſt Mechanicks that work in Wood; they are alſo a beautiful Ornament, and a ſure defence againſt impetuous Winds, and nipping Cold.

Privet. Privet is a Plant that hath been in great requeſt for adorning Walks and Arbors, till of late other new and more acceptable Plants by degrees begin to extirpate it out of the moſt modiſh Plantations, nevertheleſs it may yet claim a corner in ours.

SECT.

SECT. VI.

Of Shrubs and other Trees less useful, yet planted for Ornament and Delight.

Myrtle. This Tree requires a Winter-shelter, is raised usually by slips and layers, but may be raised of Seeds; it is a very sweet and pleasant Plant.

Box. The Box is a Plant that hath been much more in use than now it is in the Garden, from whence most banish it by reason of its injurious scent, it deserves to be planted in the more remote parts; it will grow in any indifferent Land, and is encreased by slips; the Tree is a very curious Ornament, and may be reduced to diversity of shapes and forms, and yields a most excellent Wood, than which none is more desired by our Mechanicks.

Juniper. This Tree is highly commended by Mr. *Evelin* in his *Sylva*, for a Tree that may be formed into most beautiful and useful Hedges, and that one only Tree covered an *Arbor* capable for three to sit in, seven foot square, and eleven in height, yet continually kept shorn, having been planted there hardly ten years. They are raised of their Berries, which come up in two months.

Tamarisk. This Tree groweth tall and great, is increased by Suckers and Layers, and is usually planted by those who respect variety and pleasure: the Wood also is medicinal.

Arbor Vitæ. Is usually propagated for its pleasant green leaf, though the cold Winter makes it dark and brown; it is usually planted by slips and layers.

Some flowering trees and other trees of delight. There are several Trees that are planted on the edges of Walks, and in spare places in Rural Gardens and Orchards, only for their Ornamental habits they usually wear in the Spring and Summer, as *Arbor Judæ*, *Laburnum*, the *Genà-tree*, *Spanish-broom*, the *Bladder-nut*, the *Gelder-rose*, the *Pipe-tree*, *Paliurus*, *Jessamies*, *Woodbinds*, *Virgins-bower*, the *Strawberry-tree*, *Mezereon*, *Laurus-tinus*, double-flowred *Pomegranats*, *Apples*, *Pears*, *Cherries*, *Peaches*, &c. *Roses of all sorts*, and several other Trees, yielding great variety, pleasure, and content to the Laborious Husbandman. For the nature, ordering, and propagating, and uses of them, and all other pleasant Plants, Flowers and Herbs, I must refer you to those Tracts that peculiarly handle that Subject, my intentions being only to promote the Propagation, and encourage the Industrious in their advancing of such Trees, Plants, Grains, &c. that are necessary and profitable to the Country-farmer, although I have a little in this place digressed from my former purpose: But return, and give you an account

SECT. VII.

Of such Trees that are necessary and proper for Fencing and Enclosing of Lands, Orchards, Gardens, &c. And the best way of raising such Fences.

Seeing that Fencing and Enclosing of Land is most evident to be a piece of the highest Improvement of Lands, and that all our Plantations of Woods, Fruits, and other Tillage are thereby secured from external Injuries, which otherwise would lie open to the Cattle:

Texendæ sepes etiam, & pecus omne tenendum est,
Præcipue dum frons tenera, &c. Virgil.

And also subject to the lusts of vile persons, as old *Tusser* observed, where Fences and Enclosures were deficient.

What Orchard unrobbed escapes?
Or Pullet hare walk in their Set?
But homeward or outward (like Apes)
They count it their own they can get.

For which reason we are obliged to maintain a good Fence, if we expect an answerable success to our Labours. I shall therefore enquire out the most proper Trees for that purpose: And first, the *White-thorn* is esteemed the best for fencing; it is raised either of Seeds or Plants; by Plants is the speediest way, but by Seeds where the place will admit of delay, is less charge, and as successful, though it require longer time, they being till the Spring come twelvemonth ere they spring out of the Earth; but when they have past two or three years, they flourish to admiration.

The Holly. Next unto the White-thorn, is the Holly, which claims a preference much before the White-thorn, were it not for its slow growth in its puberty; which may the better be born withal, if we consider the excellencie thereof, either for sight, ornament, or defence; for thickness and closeness it may compare to a Wall or Pale to defend your Inclosure from Winds, or the eyes of ill neighbours; and for its strength against man or beast is impregnable; for height or thickness it will answer your desires.

It is raised of the Berries of the Sets, as is the White-thorn, but the Sets are more difficult of growth, unless they are planted late in the Spring, and well watered.

Pyracantha. This Plant deserves a principal place amongst our Trees for Fences, it yielding a very strong and firm prickly branch, and ever-green leaves; is quick of growth, and easie of propagation; it is raised either of the bright Coralline berries, which hang most part of the Winter on the Trees, and lie as long in the ground

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ere they ſpring, as the Haw-thorn berries, or elſe it is raiſed of Suckers or ſlips.

The Black-thorn (and Crab alſo) yield a very good Fencing branch, and are raiſed as the White-thorn. *Black-thorn.*

A conſiderable Fence may be made of Elder, ſet of reaſonable luſty Truncheons like the Willow, and may be laid with great curioſity; this makes a ſpeedy ſhelter for a Garden from Winds, Beaſts, or ſuch-like injuries, rather than from *rude Mechers*. *The Elder.*

Furzes, Brambles, *&c.* are very neceſſary for the planting of dry Banks, where it is difficult to raiſe a better Fence, and in thoſe places they will maintain the Bank againſt any Cattle. *Furzes* are alſo ſown on barren Land, and eſteemed a conſiderable Improvement, the green tops are good food for Horſes, the pricklines thereof being taken away by chopping. *Furzes, &c.*

Let your Plants be about the bigneſs of your thumb, if you can, and ſet almoſt perpendicular, and cut within four or five inches of the ground, and planted in a double row at about half a foot diſtance; they will proſper infinitely, and much outſtrip the cloſeſt ranges of our trifling Sets. *The ſpeediſt and beſt way of planting a Quickſet-Hedge.*

The other way moſt followed for the planting of a quick Hedge, is on the Bank of a Ditch thus: Place the firſt row of Sets on the brink of the Ditch in the upper-mould, and cover them with the better part of the mould taken out of the Ditch, and raiſe the bank about eight or ten inches above them; then place another row of Sets, each Set againſt the ſpaces of the firſt row; then lay more of the beſt mould to the roots of the Sets, and raiſe the bank as before, and place another row of Sets oppoſite to the firſt, applying the beſt mould to the Roots, and finiſh the Bank with the bottom of the Ditch. *Another way more uſual, and better for the Field.*

You may plant it as the White-thorn; but if you think that too tedious to wait its riſe, you may plant it with the White-thorn, and let every fifth or ſixth be an *Holly-ſet*, they will grow infallibly with the Quick, and as they begin to ſpread, make way for them by extirpating the *White-thorn*, till they quite domineer. *Of planting the Holly-hedge.*

Alſo you may lay along well-rooted Sets a yard or more in length, and ſtripping of the leaves and branches, cover them with a competent depth of Earth, and they will ſend forth innumerable Suckers, which will advance into an Hedge. Holly is one of the ſloweſt, though beſt Plant for a Fence.

All theſe Hedges being young ſhould be carefully Fenced with a dry Hedge from the biting of Cattle on both ſides, if need require, until the the tops are out of their reach; and where any fail, to ſupply them in time with new, or to plaſh the next to fill ſuch vacant gaps. *Preſerving of Hedges from Cattle.*

Whileſt they are yet young, they are to be conſtantly weeded, leſt the Weeds prevent the thick-ſpreading of the Hedge at the bottom, as well as check the growth and proſperity of the Plant. *Weeding of Hedges.*

If your Hedge ſtand remote, or that you do not Annually keep it clipt whereby it ſhould thicken, then at about ſix years age you may plaſh it about *February* or *October*. Some workmen are far more expert and judicious at this than others are, and can bet- *Plaſhing of Hedges.*

ter do it than any pen can direct, therefore I ſhall not trouble you therewith, but leave you to the ſkill of the workman.

Whatſoever you plant or make your Fences withal, it is a piece of very good huſbandry to plant at ſome convenient diſtance Setters either of Timber proper for the Soil, or of Crabs whereon to graff Apples, or Perry-ſtocks for Pears, as you ſhall be adviſed or judge convenient; which will very much improve your Land for the future, and commend the induſtry of the Planter.

SECT. VIII.

Of the Nurſery for the more convenient propagation of moſt of the fore-mentioned Trees.

Trees produced of Seeds, &c.

Several of the ſaid Trees are uſually produced of the *Seed*, *Maſt*, or *Berries*, and thoſe are the *Oak*, *Beech*, *Cheſnut*, *Service*, *Maple*, *Sycomore*, *Horn-beam*, *Quick-beam*, *Haſel*, *Firs*, *Pines*, *Pinaſter*, *Pitch-tree*, *Cypreſs*, *Cedar*, *Bays*, *Laurel*, *Privet*, and *Juniper*, which being ſown ſpring the firſt year; and the *Aſh*, *Phillyrea*, *Eugh-tree*, *White-thorn*, *Black-thorn*, *Holly*, and *Pyracantha*, whoſe *Seeds* or *Berries* uſually lie in the Earth another year after they are ſown, ere they ſpring.

Beſt raiſed of Seed.

To produce Trees immediately of the Seed is the better way: Firſt, becauſe they take ſooneſt: Secondly, becauſe they make the ſtreighteſt and moſt uniform ſhoot, being very conſiderable in Timber-trees: Thirdly, becauſe they will neither require ſtaking, nor watering, which are two very conſiderable Articles: And laſtly, for that all tranſplanting (though it much improve Fruit-trees) is a conſiderable impediment to the growth of *Forreſt-trees*, but if they are removed out of the *Nurſery* whileſt they are young, and carefully preſerved, this injury is not ſo great; alſo Plants raiſed of the Seed in the place where they are to ſtand, ſhall ſoon outſtrip a removed Plant of a greater age, eſpecially the *Pine* and *Walnut*, where the *Nut* ſet into the ground ſhall certainly overtake a Tree of ten years growth which was planted at the ſame inſtant.

Preſerving and preparation of the Seeds.

Becauſe of the coldneſs of the Winter, and the damage the *Maſt*, *Seeds*, or *Berries* may receive from *Mice*, and other *Vermine*, it is not good to ſowe them till the Spring, for the better preſerving of them from drying, rotting, or decaying; you may put them into Pots, Barrels, or other Veſſels, Cellars, Sheds, or ſuch-like places, with a mixture of *Earth* or *Sand*, not too dry, intermixed *ſtratum ſuper ſtratum*, with the Seeds, *&c.* At the Spring you will finde them ſprouted, and being committed to the Earth, as apt to take as if they had been ſown with the moſt early.

Some affirm that by this way of preparing the Seed, *&c.* thoſe Seeds that otherwiſe would have lain over another Winter in the ground before they had ſprung, being now committed to the ground before the Full in *March*, will that ſeaſon be chitting, and ſpeedily take root.

Chuſe

Chuſe not your Maſt or Seeds from the aged, decaying, or not thriving Trees, but from a thriving Tree, of a ſound ſtock, and firm Wood, and let the Seed be the moſt weighty, clean and bright. *Election of the Seed.*

Make choice of ſome ſpare place of ground well Fenced and ſecured from Cattle, Conies, *&c.* reſpecting the *South-Eaſt* rather than the full *South*, and well protected from the *North* and *Weſt*; let the ground be rather dry than moiſt, for Trees will rarely thrive being removed out of a wet into a dry place, but exceeding well out of a dry into a moiſt; break up the ground, and prepare it the Winter before you ſowe it; the cleaner it is from Weeds, and the lighter and mellower the ground is, the better will the Seeds thrive, for in much weeding the young Plants are indangered. *Place for a Nurſery.*

The Nurſery for your Firs, Pines, Cypreſſes, and all ſuch *Winter-greens*, and tender Plants, had need be ſheltered from the *Southern Aſpects* either artificially, or elſe made where it is naturally ſo defended.

You may make Furrows or Trenches of four or five Inches deep, at about two foot breadth, with a convenient Interval for the more commodious Weeding and dreſſing the Plants: Into theſe Furrows caſt your Seed or Maſt, ſuch as uſually ſpring the firſt year in beds by themſelves; and ſuch that ſtay the ſecond, by themſelves, or (as it is beſt for the better ordering them at their removal) ſowe each Seed or Maſt apart, then cover them with a Rake. *Manner of ſowing.*

The Seeds of *Firs*, *Pines*, &c. need not be ſown above an inch deep, and covered finely with a Sieve, and duly watered.

If the Seeds of *Pines*, or *Firs* be rolled in a fine Compoſt made of Sheeps-dung, and planted, they never fail.

But for the more convenient removal of the Pine (which leaſt abides it of any Tree I know) take ſmall earthen *Pots* without bottoms, or ſmall *Baskets*, *Boxes*, or ſuch-like, and ſet them to the brims in rows in the ground, and fill them with good mould, and plant in each of them two or three Seeds; when they grow, leave only one, and by this means at two or three years growth may you ſecurely remove them, the Earth being kept faſt about the Roots; and where-ever you plant them the Tree it ſelf in time will rid its ſtem of the Pot or Box.

When the young Imps or Seedlings are ſprung up, you muſt be very careful in keeping them from Weeds, which elſe will ſoon over-run them; and after weeding the ground being unſettled, give them a little water if it be a dry and hot ſeaſon. *Ordering of the Nurſery.*

The Winter following you may lay a few Buſhes, Furze, or ſuch like over them, and ſcatter a little Straw onely to break the force of the Winds, which in the Winter ſeaſon injure more than Snow or Froſt.

But for the *Cypreſs*, *Phillyrea*, and ſuch other tender Winter-greens, you muſt defend them with more care.

If you intend to raiſe a *Coppice* from *Maſt*, or *Seed*, dig or plough the *Sowing of a Coppice.*

the parcel of ground you intend, as you would prepare it for Corn, and with the Corn either in the *Autumn* or *Spring*, ſowe alſo good ſtore of ſuch *Maſt*, *Nuts*, *Seeds*, *Berries*, &c. as you deſire; then take off your Crop of Corn, and lay it up for Wood; although that ſeveral ſorts of your Seeds come up the firſt, yet will they receive but little injury by treading at the Harveſt, but injure it as little as you can: alſo the ſtubble being left high, will be a ſhelter for the young Trees the firſt Winter.

SECT. IX.

Of the Tranſplantation of Trees.

The time. The beſt time for removing or tranſplanting of all Trees that ſhed their leaf, is in *October*, or the beginning of *November* immediately after, or at the fall of their leaf; but that time being omitted, you may tranſplant them till the Spring in open weather, and before they bud.

All Trees that ſhed not their leaf Annually, but are ever green are to be removed in the Spring when the cold is over, for they ſpring not ſo ſoon in the year as the other: But ſome affirm the only time to be in *Auguſt*.

Cut not the tops of ſome Trees. Such Trees that are *pithy*, as the *Aſh*, *Sycomore*, *Lime-tree*, *Aſpen*, and ſuch-like, cut not off their tops the firſt year of their remove, becauſe the wet will be apt to periſh the Plant; neither diminiſh the heads, nor many of the branches, nor Roots of the *Firs*, *Pines*, or other *Roſinaceous* Trees, for they are prone to ſpend their Gum, to the great injury, if not ruine of the Plant.

Of ſuch Trees that come of Slips, Suckers, &c. The ſame time and Method is to be obſerved in the tranſplantation, removal, or propagation of the Suckers, Cions, Slips, or Layers of the *Elm*, *Birch*, *Lime-tree*, *Horſe-cheſnut*, and ſuch other Trees that are uſually produced of Suckers, Layers, Slips, *&c.* as you do in the removal of the young Seedlings of the other Trees.

Time to ſlip or lay. Only that for the ſlipping or laying of ſuch Branches of Trees that had not before taken any Root, the moſt proper time is in the top of the Spring, about the time that the Sap is newly riſen, and the Tree ready to bud.

The time for Aquaticks. All Trees that are raiſed of *Pitchers*, or *Sets*, as the *Poplar*, *Aſpen*, *Abel*, *Alder*, *Withy*, *Salley*, *Oſier*, *Willow*, *Elder*, and *Privet*, are to be planted in *February* or *March*, before they are too forward.

Manner of tranſplanting. Let your young Plants be removed rather into a better mould (though there is but a little about the Roots) than a worſe: let as much Earth adhere to the Roots as you may, and leave as much of the Root on as you can, abating only the *top-root* or *downright Roots*, and ſpread the other every way in the pits or holes made for that purpoſe, which ought to be made larger and deeper than the Plant at preſent requires, and filled up with looſe mould, that

that young Roots may the better ſpread to ſeek nouriſhment for the Tree.

In Tranſplanting be ſure to preſerve the ſmalleſt Roots which gather the Sap; and in filling the Earth about the Tree, endeavour to keep them to a level with Earth between them, that they may not be irregularly placed; for the well ſettling theſe Roots will conduce very much to the proſperity of the Tree.

It is good to plant it as ſhallow as might be, and not below the better part of the Earth into the Gravel, Clay, Sand, nor Water, *&c.* but rather advance the Earth about the Tree, than ſet the Tree too deep; be ſure alſo not to ſet it deeper than it ſtood before. *Plant ſhallow.*

In the removal of ſuch Trees that have arrived to any conſiderable bigneſs, it is very expedient to obſerve the *coaſt* and ſide of the ſtock, which way it ſtood before its removal; and not to be eſteemed ſuch a trifle as *Lawſon*, and many other trifling *Authors* pretend: For it is moſt evident that the Sap doth naturally flow moſt on that ſide of the Tree that's next the Sun, and on that ſide doth the Tree more encreaſe than on the other, as is evident in obſerving the Pith to be nearer the *North* than *South*-ſide of the Tree: But in ſuch Trees that ſtand thick in a Nurſery, or have long ſtood in the ſhade, where the *Sun* hath wrought little or nothing upon them, you may be leſs critical. *Obſerve the coaſt.*

The *Oak*, *Pine*, and *Walnut-trees* bear ſpreading large branches, and require greater diſtances than any other; therefore the neareſt ſhould ſtand forty foot. *The diſtance.*

The Beech, Aſh, Eugh, Fir, Cheſnut, *&c.* may ſtand ſomewhat nearer than the other.

The Elm, and the Horn-beam will grow the neareſt of any Trees: For the other, you may plant them at what diſtance the magnitude of the Tree, your occaſions, or the nature of it requires.

The Watering of your Trees immediately upon their tranſplantation, very much conduceth to their proſperity, and ſettling the Earth about the Roots, unleſs in weather extreme cold, and where the Plant is of a tender kinde: Alſo the young Plants for the firſt year will require your aid in watering of them in a dry Spring. *Watering of Trees.*

Alſo if Trees have been carried far, the ſetting of the Roots in Water ſome certain time before you *inter* them, *conduces* much to their *revival.*

If the Trees be of any conſiderable height, they ought to be carefully defended, as well from the injurious Winds, as the frications of Beaſts, by ſtaking them, and with a wiſp of Hay or other ſoft *Ligament* to binde them to ſuch ſtake, not omitting to interpoſe a little Moſs, or Hay, *&c.* between the Tree and ſtake, to preſerve it from galling: If your Trees be in danger of Cattles injuries, then you ought to bind or ſet buſhes about them, to prevent rubbing. *Staking of Trees.*

Planters in moſt places do ſtrictly obſerve to cut the foot or ground *Planting of Aquatiels.*

ground-end of *Poplar*, *Withy*, or other *Aquatick Pitchers* or *Sets*, only one way, like a Hindes foot, pretending that to be a principal observation.

Removing Trees in Summer.

If either your impatient fancie, or your urgent occasions oblige you to the removal or Transplantation of Trees in the Summer; you may tread in the steps of a certain *Prince Elector* that at *Hidelbergh* in the midst of Summer removed very great *Lime-trees* out of one of his *Forrests*, to a steep hill exceedingly exposed to the heat of the Sun, the Heads being cut off, and the Pits into which they were transplanted, filled with a Composition of earth and *Cow-dung*, which was exceedingly beaten, and so *diluted* with Water, as it became almost a Liquid *Pap*, wherein he plunged the Roots, covering the Surface with the Turf: It is presumed that if the Trees were smaller, be they of what Wood soever, there needeth not so absolute a decapitation.

Transplanting of great Trees.

Several relations there are of Trees that have been planted or removed of eighty years growth, and fifty foot high to the nearest bough, wafted upon *Floats* and *Engines* four long miles, with admirable success, and of Oaks planted as big as twelve Oxen could draw; to which effect, these are prescribed, as the ways to accomplish the like designes.

Chuse a Tree as big as your *Thigh*, remove the *Earth* from about him, cut through all the *Collateral* Roots, till with a competent strength you can inforce him upon one side, so as to come with your Axe at the *Tap-Root*; cut that off, redress your Tree, and so let it stand covered about with the mould you loosened from it, till the next year or longer, if you think good; then take it up at a fit season.

Or a little before the hardest Frost surprise you, make a square Trench about your Tree, at such distance from the stem as you judge sufficient for the Root; dig this of competent depth so as almost quite to undermine it, by placing blocks and quarters of Wood to sustain the Earth; this done, cast on it as much Water as may sufficiently wet it, unless the ground were moist before; thus let it stand till some very hard Frost do bind it firmly to the Roots, and then convey it to the pit prepared for its new station.

But if it be over-ponderous, you may raise it with a Pully between a *Triangle*, placing the Cords under the Roots of the Tree; set it on a *Trundle* or *Sled* to be conveyed and replanted where you please: by these means you may transplant Trees of a large stature, and many times without topping or diminution of the head; which is of great importance to supply a *defect*, or remove a *Curiosity*.

Helps to Trees.

After you have transplanted your Trees, if you lay about the Roots or Stems, *Fern*, *Straw*, *Stubble*, *Hawm*, or any other Vegetable whatsoever, either green or half rotten is best, which will preserve the Roots moist in the Summer, and yield a good Manure or Soil, which the Rain will carry to the Roots.

Also stones laid about the Roots of Trees preserves them moist

in

in the Summer, and warm in the Winter, and keeps them fast againſt the ſhaking Winds.

Copſes may alſo be planted about *Autumn* with the young Sets or Plants, the beſt way is in rows about ten or fifteen foot diſtance, for then may you reap the benefit of the *Intervals*, by Ploughing, or Digging and Sowing, till the Trees are well advanced; Carts alſo may the better paſs between at the time of felling without injury to the *Stems*, or danger of the Cattle; There will alſo be many pleaſant Walks, and yet an equal burthen of Wood at the full growth of the Copſe, as though they were thick, and confuſedly planted. *Planting of Copſes.*

There is a compendious way for thickning of Copſes that are too thin, by laying of ſome of the Branches of the Trees (that ſtand neareſt unto the bare places) on the ground, or a little in the ground, giving it a chop near the foot the better to make it yield; this detained with a hook or two, and covered with ſome freſh mould at a competent depth, will produce a world of Suckers, and thicken and furniſh a Copſe ſpeedily. *Thickning of Copſes.*

SECT. X.

Of the Pruning, Shrowding, Cutting, and Felling of Trees and Copſes.

In the diſcreet performance of this work, the Improvement of our Timber and Woods doth much conſiſt; and renders our Avenues, Walks, Parks, *&c.* much more pleaſant and commodious to have the Trees ſtand in order, their Branches at a convenient height, and kept clean from all ſuperfluities. *Pruning of Trees.*

Such Trees that are for Timber, it's beſt to prune whileſt they are young, and the Branches not too big; of theſe and other Trees it's good to cut off the Branches that are ſuperfluous, about *January*, with a very ſharp Bill or other Tool, making the ſtroke upward by reaſon of the grain of the Wood, and to prevent the ſlitting of the Tree at the fall of the Branch, and cut it clean, ſmooth, and cloſe; for by cutting of the Branches at a diſtance from the Tree, the ſtumps rot, and leave hollow holes which decay the Tree, and ſpoil the Timber.

Such Trees that are not fit for Timber, or that you deſire ſhould yield you a preſent advantage, or ſerve for Fewel, you may ſhrowd or lop them, which will return you a conſiderable advantage, and is much to be preferred before a Copſe in theſe ſeveral reſpects: 1. Theſe Pollard or Shrowded Trees need no Fence to be maintained about them, ſtanding in no danger of the browſings or Frications of Cattle, Conies, *&c.* 2. You have the benefit of Grazing under theſe Trees, which is very conſiderable whileſt the tops are young. 3. The ſtocks taken in time before they decay or grow hollow, yield a good Timber fit for many uſes, or at leaſt good cleft for the Fire. 4. And laſtly, you may raiſe theſe *Shrowding or lopping of Trees.*

Pollards

Pollards in Hedge-rows and ſpare places, and borders of your grounds, where they prove a good ſhelter as before we noted, and little injure the ground.

Notwithſtanding the Copſe is quicker of growth, and raiſes a more conſiderable advantage for the preſent than this way, in ſome places, therefore where you have conveniences for a Copſe, I leave you to your election.

Times for ſhrowding. Trees are not to be ſhrowded till they have taken faſt rooting, and ſo ſtood for three or four years, at what height you think convenient, ſo it be out of the reach of Cattle, either at the beginning of the Spring, or the end of the Fall. For the harder ſorts of Woods it is very indifferent, obſerving that they be not lopped above once in ten or twelve years, and at any time in the Winter. The Elm and the Aſh, and ſuch-like pithy and ſofter Woods are fitteſt to be ſhrowded at the Spring, leſt the Winter injure the Tree.

Obſervations in ſhrowding. Always obſerve to cut the remaining ſtumps aſlope, and ſmooth, that they caſt the Water off, that the Tree periſh not.

Take not off the head of the Poplar, nor of any of the ſoft Woods (before unſhrowded) growing upright, and ſmooth, after they have attained the bigneſs of ones Leg, unleſs you leave ſome Collateral ſhoots to attract the Sap; for it will endanger the Tree.

Pruning of Winter-Greens. All *Perennial Greens*, or Reſinous Plants, are not to be pruned or cut until the greater Froſts and bitter Winds are paſt, and then not in any wiſe decapitate the Fir, Pine, nor ſuch pithy Plants, and be very ſparing of their Collateral Branches.

Cutting of Aquaticks. You may cut Aquatick Trees every third or fourth year, and ſome more frequently according as the Tree is in proof, or the ſhrowds or tops fit for your occaſions; cut them not too near the main ſtock, becauſe of periſhing the Tree; and beſides, it gives leave for the new ſprouts.

The time. The beſt time for cutting Aquaticks, either to dreſs or plant them, is about the beginning of *March*, or the firſt open weather at the Spring; but if for the Fire, in the Winter before the Sap begins to riſe, or you may cut them at any time between Leaf and Leaf.

Cutting of young Copſes. Such *Copſes* or *Copſe-trees* that you have lately planted at one, two, or rather three years growth, may be cut within two or three inches of the ground, in the Spring-time (the leſs proſperous eſpecially) which the new Cions will ſuddenly repair in cluſters, and tufts of fair Poles.

Felling of Copſes. Copſes being of a competent growth, as of twelve or fifteen years, are eſteemed fit for the Axe: but thoſe of twenty years ſtanding are better, and far advance the price: ſeventeen years growth affords a tolerable Fell: you are to ſpare as many likely Trees for Timber, as with diſcretion you can.

The growth of Copſes is ſo various according to the nature of the Ground, ſome being dry and barren, ſome moiſt and fruitful, that no time can be ſet but as the Copſes are quick or ſlow in growth

growth, and the bigneſs of the Wood ſuits with the Market, or your occaſions, ſo may your diſcretion be guided.

Copſes may be felled or cut from mid-*September* to mid-*March*, and to be avoided by mid-*May* at the fartheſt, elſe much injury may be done by Teams in bruiſing the young Cions, and injuring them with their feet; alſo the removing of the *Rough* or *Bruſh*, breaks off many a tender Sprig. *Time.*

Cut not above half a foot from the ground, and that ſlope-wiſe, trimming up ſuch as you ſpare for Standards, as you go from their extravagant Branches, Water-boughs, *&c.* that hinder the growth of others. *Manner.*

After the Felling and removing of the Wood, ſhut up all the Gaps about the Copſe, having received a ſufficient Hedge about the ſame before the Spring, and ſo keep it fenced and defended from Cattle, till it be above their reach; then about *July* may you put in your Beaſts to ſpend the Herbage in ſuch well-grown Copſes.

If your Copſes have been neglected, ſo that they have been browſed by Cattle, and kept under that they are not apt to thrive, the beſt way is at felling-time to new cut them, and preſerve them better from Cattle, and they will ſoon be reduced to a better ſtate than before, and thrive beyond expectation.

When your Timber-Trees are arrived to their perfect age, full growth, or beſt ſtate, (for at ſuch a time it cannot be eſteemed ill-huſbandry to take them away, ſo that you be careful to preſerve others in their ſtead, though not in their places) or that you are neceſſitated to fell them, then conſider which way, and what time is beſt for your advantage. *Felling of Timber-trees.*

The time of the year is to be conſidered of according to the occaſions or uſes you have for your Timber; if it be for ſale, and that your preſent advantage only you ſeek, then the beſt time to fell Oak is from mid-*April* to Mid-ſummer, the Sap being then proud, and the Bark eaſie to be taken off, which will yield you a conſiderable price. But all other Timber whileſt the Sap is down in the Winter-ſeaſon. *Time.*

If you deſire your Oaken Timber for your own proper occaſions, fell it in *December* or *January*, when the Tree is cleareſt of Sap, by which means the Timber will not be ſo much ſubject to the Worm, neither will it *caſt*, *rift*, or *twine*, as it will if cut in the Summer: It will alſo laſt longer in any Buildings, and not be ſo apt to yield under a Burden: for the great plenty of Sap mollifies the Timber, and makes it rot and decay; therefore the cutting of Trees at Barking-time, doth very much injure our Timber, debilitates our Edifices, and expedites their approaching decay.

Fell not in the increaſe nor full of the Moon, nor in Windy-weather, at leaſt in great Winds, leſt it throw the Tree before you are willing. I have ſeen a good Tree much injured by falling too ſoon.

For the Felling of the greater ſort of Timber-trees, one of the firſt *Manner of felling great Trees.*

first and most principal things is, the skilful disbranching of the *Boal* of all such Arms and Limbs as may endanger it in the fall; for many excellent Trees have been utterly spoiled for want only of this consideration: In the greater Arms chop a nick under it close to the *Boal*, and meet it with the down-right stroke, it will be cut without splitting.

If you reserve the Roots in the Earth in expectation of a new encrease of Suckers; then fell the Tree as near the Earth as you can, for that is the best Timber: But if you intend a total extirpation, then grub the Tree, which is more for your advantage: some advise to Bark the Trees as they stand, and the next season to fell them; which I take to be worthy of your practise.

CHAP. VII.

Of Fruit-trees.

SECT. I.

Of the Profits and Pleasures of Fruit-trees.

THE planting of Fruit-trees is undoubtedly one of the greatest Improvements that can be made of the most part of our English Land, as all who have written of Improvents do agree; and *Worcester-shire*, *Hereford-shire*, *Gloucester-shire*, *Kent*, and many other particular places in this Land can sufficiently evidence the truth thereof.

1. Because it is more universal than many other sorts of Improvements, there being but little ground in *England*, but one sort of Fruit or another will prosper upon it, if judicially prosecuted.

The Charge of planting or raising most sort of Fruit-trees being so small, and the pains so easie, that the most slothful hath not any rational objection against it; but the most common is, that the poorer sort of people will rob and spoil the Plantations, *&c.* If you plant but a few, this objection may have place; but if you plant any considerable number, it will be worth while to attend them at that season, which is but short, when they are pallatable; or to plant such that are not very inviting, and yet as profitable to the Planter as the most pleasant.

And when they become more common, they will be little regarded by these Filchers; or if they do borrow a few sometimes in their Pockets, or to make a few Apple-pies withal, yet that is a poor discouragement to an ingenuous Spirit; and much like that Rustick Humor of one that would not improve a very good piece of ground for that purpose with Fruit-trees, because the Parson would have the decimation of it; and so denied himself the nine

parts, becauſe the Parſon ſhould not have the Tenth; which indeed is a grand Impediment to Improvement: and it is to be wiſhed that there were ſome more certain *Modus* in lieu of that troubleſome way of Tything.

This way of Improving by planting of Fruit-trees is more practiſed within theſe few years than hath been in Ages before; a ſufficient Argument of the benefit the Country-man receives by it. The Computation may be taken from the expence of the young Trees, eſpecially of Syder-fruit that our Nurſeries have annually yielded throughout the greateſt part of this Kingdom.

2. The uſe of Fruits is alſo univerſal both for meat and drink: That there cannot be an over-ſtocking of the Country with them, eſpecially of Syder-fruits. This drink being more univerſally celebrated than any other, as the moſt pleaſant (being of good Fruits, and rightly prepared) the moſt healthy and the moſt durable of any other, and muſt neceſſarily bring a very conſiderable advantage to the whole Kingdom in general, becauſe a far greater quantity of Syder is uſually produced out of an Acre of Land in one year, than can be made of the Barly growing on an Acre, and much leſs coſt and trouble in the preparation; ſo that if but a ſmall part of every Farm were planted for Syder, much of the Barley-land might be converted to other uſes, which in the end would be a National Improvement and advantage.

It will alſo leſſen that vaſt conſumption we make of French Wines, which we drink to the enriching of a Foreiner, the impoveriſhing of our ſelves, and the great prejudice of our healths, eſpecially by the corroding Claret, and ſtummed White-Wines, when we have a thouſand Teſtimonies that Engliſh Syder is to be preferred before any French-Wines, and known to be more Homogeneal to our Natures.

Mr. *Hartlib* in his Legacie tells you of the benefits of Orchard-fruits, that they afford curious Walks for pleaſure, food for Cattle in the Spring, Summer, and Winter (meaning under their ſhadow) Fewel for the fire, ſhade from the heat, Phyſick for the ſick, refreſhment for the ſound, plenty of food for man, and that not of the worſt, and drink alſo of the beſt; and all this without much labour, care, or coſt.

The high Applauſes, Dignities, Advantages, and variety of Pleaſures and Contents in the planting and enjoyment of Fruit-trees, Mr. *Ralph Auſten* hath very copiouſly and particularly ſet forth in his Treatiſe of Fruit-trees, to which for brevity-ſake I refer you, and ſhall only in this place give you a Catalogue of ſuch Fruit-trees as are for our advantage, with the ſeveral ways of propagating and ordering of them. And firſt of Standard-trees.

Amongſt which the Apple worthily deſerves the prehemi- 1 *Of Apples*
nence, both for its univerſality of place, ſcarce a Country-pariſh in *England* but in ſome part or other it will thrive; and alſo for its uſe, being both Meat and Drink, and generally eſteemed by the moſt curious, as a pleaſant Diſh. It alſo exceeds all other Engliſh-

Fruits for the time we enjoy them; not a day in the year but they may be had, and not of the worſt. There is a very great diverſity of the Species of them; Mr. *Hartlib* ſpeaks of one who had about two hundred ſorts, or Species, and does verily believe there are near five hundred in this Iſland: The French Gardiner reckons up eighty ſeven ſeveral ſorts of choice kinds of them in that Country; I preſume he computes not the common.

Apples. They are of different Natures; ſome are early ripe, ſome later; ſome are but for a time, others are long preſerved: I have heard of Pippins that have been kept two or three years ſound, only by care in gathering of them, and at the right ſeaſon, kept in a Room free from the common Annoyances of Heat and Cold, and hung by the Tails: ſome are preſerved for the Table, others for Cider; the beſt for the Table are the Jennitings, the Harvey Apple, the Golden Pippin, Summer and Winter Pearmains and Pippins, the *John* Apple, with many others. There is a ſort of Ruſſeting, with a fine rough Gold-coloured ſkin, with ſome Warts on it, which I can give no other name than the *Aromatick Ruſſeting*, knowing no other for it; which Fruit excels any other Apple I have ſeen or taſted, and is worthy to be placed, not only the Tree in the beſt of your Plantations, but the Fruit at the beſt of your Brumal Repaſts. The Tree may be had at Mr. *George Ricket's*, near *Hodſden*; and at Mr. *Ball's* at *Brainford*, two of the beſt Planters in *England*. The beſt for Cider are the Red-Streak, the Jennet-Moyl, Eleot, Stocking Apple, and ſome others.

Profits of Apples. Apples planted diſperſedly about your Ground, either in the Hedges, or in Rows by the Hedges, raiſe a very conſiderable advantage, at a very eaſie Rate or Charge, and that only in Nurſing them up till they are freed from common injuries; the great advantages accrewing thereby, are evident to the Inhabitants of *Hereford-ſhire*, *Gloceſter-ſhire*, and ſeveral other places in *England*. I heard it certainly related in *Hereford-ſhire* of a Tenant that bought the Living he then Rented, only with the benefit he made of the Fruit growing thereon in one year; with this advantage, that he utter'd his Cider by Retail, as they uſually do Beer. Orchards planted with Apples ariſe to a very conſiderable improvement: I know (ſaith Mr. *Hartlib*) that ten, or fifteen pound an Acre, hath been given for Cherries, more for Pears and Apples; the Land it ſelf, whileſt theſe Trees are ſmall, and yield you not your deſired gain, is capable of bearing any ſort of Tillage, till the Trees yield too much ſhadow; and then, if they are not too thick, the Land is better than before it was planted, ſometimes to a three-fold improvement, and hath the Preheminency above other Paſtures in being Earlier, not ſubject to ſcorching heats; and in the Winter there is plenty of Food for Sheep, Calves, *&c.*

Legacy.

Of Pears. Next unto Apples, the Pear challengeth his place: They will proſper in ſome ſorts of Land where Apples will not, as in Stony, Hungry, Gravelly Land; yea, in a tough binding hungry Clay, the Root of a Pear-tree being, it ſeems, more able to pierce a ſtony and ſtiff Ground.

The

The Pear-tree bears almoſt its weight of Sprightful Winy Liquor; ſometimes one Tree bears two, three, or four Hogſheads *per Annum*. In *Herefordſhire* I was credibly informed, that near *Roſs* groweth a Pear-tree of that Magnitude, that the Circumference of the Body, or Stem of the Tree, was as much as three men, from hand to hand, could beclip or fathom; and that there was made in one year of the Fruit thereof 7 Hogſheads of Perry.

There are ſuppoſed to be four or five hundred ſeveral kinds of Pears; the French Gardiner reckons about three hundred of choice ſorts of Pears.

Several are for the Table; as the Windſor-Pear, Burgamets, Boon-Chriſtiens, Greenfield-Pear, *&c.* For Perry, the Horſe-Pear, both White and Red, the Boſbury-Pear, Choak-Pear, *&c.* It is worthy to be taken notice of, that the beſt Pears for Perry, and ſo of Apples for Cider, are not very pleaſant, Crude as they are from the Trees, and may be planted in the Fields or Paſtures with leſs danger of loſs than the Table-fruit.

Some of theſe alſo are for the Summer only, and will not laſt; others will keep over the Winter.

The advantage of the Pear are equal to thoſe of Apples; for though they are deficient in ſome caſes, yet they recompence it in other. It is the goodlier Tree in a Grove, to ſhelter a Houſe and Walk from Summers heat, and Winters cold Winds, and far more laſting; and for the quantity of ground it covers, bears much more than the Apple, becauſe of their height.

Of Cherries there are ſeveral ſorts; ſome of one colour, ſome of another; ſome early, and ſome late: but for the Orchard or Field, the Flanders Cherry excels. The Great-bearing Cherry alſo is a very good kind, for that he ſeldom fails; though in a cold and ſharp Spring they are late ripe, and hang near a fortnight after they are Red, before they be through ripe: they are the fitteſt ſort for the coldeſt places; they are not ſo pleaſant as the other, by reaſon of the Tartneſs of the Juyce; yet ſharp Cherries are more wholeſome than the ſweet. 3 *Of Cherries.*

The advantages of a Cherry-Orchard are very great: Mr. *Hartlib* gives the Relation of a Cherry-Orchard about *Sittenburn* in *Kent*, of thirty Acres, that produced in one Year above a thouſand pound: That Preſident might be but once; one Swallow makes not a Summer; yet they are uſually worth ten or fifteen pound *per* Acre. *Legacy.*

They are a Fruit that keep not long; therefore if your ſtore exceed your Market, a moſt excellent Wine is made of them, by thoſe that delight in ſuch Liquors, which indeed are to be preferred before Forreign.

Wall-nuts, not without deſert, challenge a principal place in our Rural Plantation; the Tree groweth tall, is a great defence againſt Winds, a moſt Excellent Ornament, delights in a dry, ſound, and rich Land, if it incline to a feeding Chalk or Marl; alſo in ſtony grounds, and on hills, eſpecially Chalky; likewiſe in Corn-fields. In ſeveral places in *Germany* no young Farmer is permitted to 4 *Of Wall-nuts. Sylva.*

Marry

Marry a wife, till he bring proof that he hath planted, and is a father of ſuch a ſtated number of Walnut-trees. The Fruit will yearly ſufficiently recompenſe the loſs of the ground it drops with a good advantage; the Timber bears a good price, and is of excellent uſe in every place, ſtrong, and not ſubject to the Worm: but is not to be entertained in Hedge-rows, no Tree thriving under its drip.

Stately Avenues and large Plantations are of them in *Surry*, to the very great advantage and recompence of the induſtry of the owners.

That which is produced of the thick ſhell of the Nut, becomes the beſt Timber; that of the thinner, the better Fruit.

If the Market ſhould happen to be overſtocked of this Fruit for the Table by over-great Plantations, yet may a conſiderable advantage be raiſed by extracting an Oyl of the Kernel, as at this time they do in *Normandy*, which is their principal uſe they convert them to. The Oyl is excellent for the Limner for laying his white Colours; it's good for Lamps and many other uſes.

5 *Of Filberts.* These are a Fruit growing ſo low, that we generally look over them; they delight in a fine mellow light ground, but will grow in almoſt any ground, eſpecially if they are defended from the violent and cold Winds: the Tree is eaſily propagated, generally bears well, and yields a moſt excellent Fruit, not much inferior to the beſt and ſweeteſt Almond. There are the White and Red, but the White is the beſt.

Being planted in rows near the greater Trees, they will bear under the ſhadow of them, and give you a good reward for your Induſtry. They delight in ſhady places, where few other fruits will proſper.

They are a Fruit that may be kept long in the huſk, or in Sand.

6 *Of Quinces.* Quinces are a very good Fruit; the Trees delight in moiſt ground, and near the Waters-ſide; and where they like their ground, they yield a very great increaſe; it is good to apply hot and rich Soils to the Roots of them, which will be fully repaid in the Fruit. There are ſeveral kinds of them, ſome are a ſmall Crab-quince; others a fair, large kinde of Quince: 'tis good to plant of the beſt ſort, and the beſt bearers; the *Portugal*-Quince is judged to be the beſt both for bearing and uſe.

Legacie. Mr. *Hartlib* tells you of a Gentleman at *Prichnel* in *Eſſex*, who had a Tree from beyond Sea, and had the beſt in *England*, and had made above thirty pound of a ſmall piece of ground planted with them.

7 *Of Mulberrits.* They are difficult to propagate; they will grow in any reaſonable good Land: the Fruit is made uſe of ſeveral ways, ſome make a Drink or Wine of them, it's very good to colour Wine or Syder; but the greateſt and moſt principal benefit and uſe of the Mulberry-tree is the leaf, being the only known food for the Silk-worm; if the Trees were more encreaſed, it would be encou-

couragement ſufficient to keep theſe curious Creatures: although many have kept them, and made great quantities of the Silk, yet the difficulty of obtaining the leaves, and where they are, they grow in Gardens generally, few in quantity, and valued according to the ground they grow on, that it's a great diſcouragement to that noble Improvement. Hartlib's Legacie.

If King *James*'s Letter for the planting of Mulberry-trees were again revived, or ſome compulſive Statute to that purpoſe, and diligently proſecuted, it would produce in time a very conſiderable advantage to this Kingdom. Legacie.

Or rather, if his Majeſty, or ſome Honourable Perſon, would allot ſome large parcel of Land, out of ſome Foreſt or Chace, to be wholly Cultivated for the raiſing of a Mulberry-wood, it would become a moſt noble Preſident for others to imitate: For the principal Advantage muſt be raiſed on ſuch Land not yet improved to the higheſt value by other Plantations, as uſually Gardens are.

8 *Of Plums.* There are many kindes of Plums, and very much differing from each other. The better ſorts, as the Muſtle-plum, the Damazine, Violet, and Premorden-Plums, with many others, are very pleaſant to be eaten, and require a very good rich warm Soil and place: the common ordinary Plums will grow almoſt any where; they are not worth the planting to be eaten, unleſs you can finde a way to make a good Wine out of them; doubtleſs they yield ſtore of Spirits or *Aqua Vitæ*.

They are the more to be regarded, for that they thrive very well in ſhady places, where, except the Filberd and the Currant, ſcarce any other Fruit will proſper.

The Damzin is one of the beſt, wholſomeſt, and moſt profitable of Plums, and deſerves a place in your Plantation: Mr. *Hartlib* gives it as a deficiencie, that the great Damzin or Pruin-plum is neglected, which groweth well, and beareth full in *England*. Legacie.

Plum-trees and Damzins may alſo be planted in Hedges, being ordinarily thorny Plants; they will thrive there better than Apples or Pears.

9 *Of Medlars.* The Medlar is a Fruit of very little uſe, the reaſon I ſuppoſe they are no more multiplyed, yet have they been of long ſtanding; they are pleaſing to the Palate: This Tree may ſerve to fill up a ſpare Corner in your Orchard.

If we could obtain the Medlars without ſtones, mentioned in the *French Gardiner*, they would be better worth the planting. The great Dutch Medlar is the beſt.

10 *Of Barberries.* The Barberry is a common Plant in Orchards, and bears a Fruit very uſeful in Houſewifry: There are ſeveral ſorts of them, although but one only common, above which is to be preferred that which beareth its Fruit without ſtones: There is alſo another ſort, and chiefly differs from the common kinde, in that the Berries are twice as big, and more excellent to preſerve.

11 *Of Almonds.* Mr. *Hartlib* condemns us much for neglecting the propagation of this Tree, which (ſaith he) groweth well, and beareth good Legacie.

Fruit,

Fruit, as he hath ſeen divers buſhels on one Tree in his Brothers Orchard; they grew large and upright, and need not the help of a Wall; the Almond is in ſome ſweet, in others a little bitter. The Tree is chiefly received for the beauty of its Flowers, which being many, early, and of a fair, pale, reddiſh colour, make a fine ſhew in a Garden.

12 *Of the Service-Tree.* The common Service-tree grows wilde in many places: but there is a kinde thereof more rare, which by long ſtanding grows to a fair Tree with many branches ſet with winged leaves, like thoſe of the Aſh; but ſmaller, and indented about the edges: The Flowers grow in Cluſters, ſucceeded by Fruits; in ſome round, in others Pear-faſhion, much bigger and better taſted than thoſe of the common kinde.

13 *Of Gooſe-berries.* There are many ſorts and colours of Gooſberries; the White-Holland, or Dutch-Gooſberry, is the faireſt, and beſt Bearer of all others: The Berries are large, round, ſmooth, white, tranſparent, and well taſted. There is a ſort of Green Gooſberry that is alſo a very pleaſant Fruit.

It's not a ſmall advantage that's yearly reaped by this Fruit, the Tree propagated with ſo much facility, and yields a wonderful encreaſe; and from the beginning of *May*, to the middle of *July*, contains a uſeful Berry.

This Tree bearing ſo great plenty of Berries, and is ſo eaſily propagated, that it may be ſuppoſed the Market, eſpecially remote from *London*, may be over-ſtockt: but this Fruit, taken in its right time, yields ſo delicate a Wine, that you cannot convert them to a better uſe, nor ſolace your ſelf with a finer Summer-Repaſt.

14 *Of Currans.* There are alſo ſeveral ſorts and colours of this Fruit; the White is very pleaſant, but the Great Red exceeds all the reſt, is a plentiful Bearer, and yields the largeſt Fruit.

The ſame may be ſaid of the Currant, as before was of the Gooſberry, it being alſo eaſily propagated, and a great Bearer, and yields a very pleaſant Liquor; to be compared, being rightly ordered, with French-Wines.

15 *Rasberries.* Rasberries are not to be omitted out of the number of the moſt pleaſant and uſeful Fruits, which yield one of the moſt pleaſant Juyces of any Fruit; and being extracted and preſerved, will ſerve to tinge any other Liquor with its delicate Aromatick Guſt.

SECT. II.

Of Wall-Trees.

Having given you a taſte of the moſt uſual Fruits growing in the Fields, Orchards, or Gardens, on Standards that neceſſarily depend not on any other Prop or Stay, I will now give you a Liſt of ſuch that are uſually planted againſt Houſes, Walls, Pales, or other Supports; not only to preſerve them from the violent Percuſſions of the Weather, but to augment the heat of the Sun, for the

the ſooner and better Maturating their Fruit; amongſt which the Vine claims the Precedency, being eſteemed by Ancient Philoſophers the King of this Vegetable Kingdom, as Man is of the Animal, and Gold of the Mineral; moſt Countries of the World enjoying the delicious fruits of this moſt excellent Plant: It is eſteemed a great deficiency, that they are no more propagated in this Iſland than they are; many are of Opinion they will prove well, being planted in Vineyards, as they do in *France*, and give many inſtances of Vineyards that have formerly been in *England*, divers places yet retaining the name of Vineyards; as in *Bromwel-Abbey* in *Norfolk*, and at *Ely* in *Cambridgeſhire*, which afforded Wine, as theſe Rimes ſeem to teſtifie.

1 *Of the Vine.*

Hartlib's Legacy.

Treatiſe of Fruit-trees.

Quatuor ſunt Eliæ, Lauterna Capella Mariæ,
Et Molendinum, necnon dans Vinea Vinum.

There are many places in *Kent* called by the names of Vineyards: The ſame likewiſe in *Glocesterſhire*, between *Glocester* and *Roſs*, is a place containing the name of a Vineyard, as I was credibly informed travelling that way.

Hartlib's Legacy.

There are at this day ſeveral Preſidents of making Wine in *England*; Mr. *Hartlib* gives an inſtance of one at *Great Chart* in the *Wilde* of *Kent*, that Yearly made ſix or eight Hogſheads, which was much commended by divers that taſted of it, and had kept of it two Years; and alſo of a Gentlewoman that preſſed her Grapes, and expecting Verjuice, drew Wine.

Without queſtion our Grapes will afford good Wine, if we can finde places enough to bring them to ſuch Maturity, as ſome years they do on the Houſe ſides, and Walls, which hath been often attempted: but I cannot underſtand that they Annually ſucceed, according to expectation; neither indeed do they on the Houſes, or Walls. The like inconveniences, though it's probable not in ſo great a meaſure, are the Vineyards in other the Northern parts of *France* and *Germany* ſubject unto; which methinks ſhould not prove ſo great a diſcouragement, ſeeing that Hops, Apples, Cherries, *&c.* are alſo ſubject unto the ſame diſappointments. But if they can be Cultivated, and raiſed to that ſtate, as to bear well, and ripen well in ſeaſonable Summers, we may the better diſpence with ſuch caſualties, as well in this, as other meaner Productions.

The places moſt commodious for this uſe and purpoſe, and moſt free from thoſe Annual caſualties or inconveniences, muſt be ſo ſcituated and defended, either Naturally or Artificially, as to be free from the continual Aſſaults of the Winds; for any Wind in the Summer Refrigerates, and impedes the Maturity of the Grape, and ought alſo to decline towards the South; if it doth not Naturally decline enough, it ought to be ſo laid by Art, that it's Elevation may be as near as you can equal to the Elevation of the Pole, or ſomewhat leſs; that it may lye ſquare to the Sun-beams, for the moſt part of the time the Sun paſſeth through the ſix Northernly Signs. The Banks or Borders ſo laid, ought alſo to be made circular (not ſtreight) as though they

Vine.

contained about the eighth part of a Circle, the Center being in the South, like the Concave of the Burning-Glaſs which burns by Reflection; for by this means it doth as it were imbrace and detain the heat received from the Sun-beams, and breaks the Winds: for I have known the faireſt, beſt, and moſt early ripe Grape, to grow on the ſide of a Houſe after the aforeſaid manner cited, when on the ſame Tree, and on another part of the Houſe, although it received as much of the Sun, they were not ſo good, nor early, by reaſon they lay more in the Wind, and the Sun-beams leſs direct.

There are ſeveral other things alſo to be conſidered of, to accelerate the Maturity of this moſt excellent Fruit, as the warmth, richneſs, and lightneſs of the Soyl, which may be much advanced by Art, in applying of ſeveral Ingredients ſuitable to that purpoſe; alſo by covering the Surface of the Ground with Tiles, Sand, or ſuch like, that may keep down the Weeds, and afford ſome aſſiſtant heat. The Land that is moſt apt to produce the largeſt Brambles, is ſaid to be the moſt Natural to the Vine, and the fitteſt to plant a Vineyard on.

It hath alſo been the uſual practiſe to deprive the Vine of its leaves in the Summer, under pretence of laying the Grape more open to the Sun; but that hath proved, rather than a help, an impediment to the Maturity of them, by depriving them of their ſhelter from the cool Airs, which in moſt Summers are more than the ſcorching heats; as I have often obſerved the beſt Grapes, and earlieſt ripe, to be under the ſhadow and protection of ſome Leaf. For what I have here ſaid, and for what elſe is neceſſary towards the propagating of this Noble Plant, I muſt ſubmit to the judgment and experience of ſuch Perſons worthy of Honour, that have made far deeper Eſſays than I have done, and are better capacitated by Reaſon, Judgment and Experience, to further and advance their Deſigne.

The Choice of Grapes alſo is very neceſſary: Mr. *Hartlib* commends the Parſley-Grape, the Rheniſh-Grape, the Paris-Grape, and the ſmall Muskadel, as moſt ſuitable to our Climate.

But if our Country-man be not minded, or have not conveniencies for the raiſing of a Vineyard, yet may it prove a very conſiderable advantage to plant Vines on the South-Eaſt and Weſt-ſides of his Houſes, Barns, and Walls; and by good Culture, and Pruning, they will yield a very conſiderable increaſe. I have known ſeveral Buſhels of Grapes grow on one Vine, being well Pruned, when the ſame Vine neglected hath yielded very few, and thoſe not ſo good as when there were many.

Although the Wine that is produced of our Engliſh Grapes be not ſo Excellent as that which is produced of other Fruits, yet to be converted to Vinegar, may prove a very great advantage; that yielding no mean price, the right way of making of it being not difficult, the ſame Method being ordinarily uſed for converting Cider into Vinegar, which may to better advantage be done with ſharp Wines.

They

They are very well known, almoſt every where; there are ſeveral kinds of them, ſome earlier, and ſome larger than the other: although the Tree will grow very well as a Standard, yet it ſeldom brings its Fruit to Maturity, unleſs it hath the benefit of ſome Wall or Pale. 2 *Of Apricocks*

This Tree flouriſhes much in a light, free, and rich Soyl, but ſpends it ſelf too much in Branch, and but little in Fruit; beſides, is ſubject to the Canker: Wherefore to correct that Vice in the Mould, the beſt way will be to dig a large Pit where you intend to plant your Tree, and fill it above a Foot thick, and within a Foot or eighteen Inches of the Surface, with Chalk, Marl, or other White Earth, if you can obtain it; by which means the Tree is prevented from rooting too deep, or drawing too much of that luſcious Sap; and ſo thereby may the Tree be more fertile, the Roots alſo lying warmer, and nearer the Sun and Air: For it is obſerved, that in White Lands this Tree is ſound, ſpends but little in Branch, and bears plentifully; and in the rich black Mould it runs out in Branch, is ſubject to the Canker, and bears but little.

There is lately a new Mode of planting theſe, and other ſorts of Fruit, as Apples, Pears, Peaches, Grapes, *&c.* in Dwarf-trees; that is, they are kept under-hand, that they attain not to full three Foot in height; by which means, being under the Wind, and having the benefit of the reflecting heat of the Earth, they produce their Fruit Mature, and early.

Peaches, Nectorines, and Melacotones, are alſo to be planted againſt Walls, Houſes, *&c.* and are of ſeveral ſorts, very much differing the one from the other; the beſt are beſt cheap. 3 *Of Peaches, &c.*

Theſe are alſo to be planted againſt Walls; but being of ſo little uſe in our Rural Habitation, I ſhall leave them. 4 *Of Figs.*

Although they are generally planted as Standards, and in the Sun, yet there is no Tree admits of a greater improvement againſt a Wall, and in the Shade, than this very Tree; it growing much larger, and ſpreading againſt a Wall to twelve or fourteen foot high and broad, on the North-ſide of a Houſe or Wall, and bearing moſt plentifully, and large and delicate Fruit. 5 *Of Currans.*

There are ſome other Fruit-trees, as the Lote-tree, the Virginia Plum, the Cornel-tree, and ſuch like, that are of ſmall uſe, advantage, or pleaſure; which I leave to the freedom of every man to plant, or uſe as he pleaſeth. *Other Fruits.*

SECT. III.

Of the Propagation of Fruit-Trees.

There are ſeveral ways of increaſing or multiplying the forementioned Fruit-Trees; ſome by Grafting, ſome by Inoculation or Budding; ſome from the Seed, Nut, or Kernel, others by Layers, Slips, and Suckers, whereof more particularly; and firſt of Grafting.

This Art hath been, for many Ages, the moſt proper, ſpeedy, and beneficial way to propagate ſeveral ſorts of Fruits; although the ſame Fruits may be raiſed by Kernels, yet do they moſt uſually prove wilde, and in taſte auſtere and ſharp, tending rather to the wildneſs of the Stock on which the Tree (whereon the Fruit grew) was Grafted; and although they ſeem fair, yet they want that vivacity of ſpirit, and are more woody than the Grafted Fruit: they are alſo of a much longer continuance e're they bear, and are not then ſo fruitful. Sometimes Apples have proved well from the Kernel, and have proved much larger Trees, and have born great burthens, (when they have been many years old) but rather by accident, and at beſt not worth ones labour. Of other Fruits, as Plums, Cherries, Aprecocks, Peaches, *&c.* unleſs Grafted, or Inoculated, are not of any value: Therefore this Art and Cuſtom of Grafting, or Inoculation, doth preſerve the Species of our moſt dainty Fruits, and meliorate their Guſts, and affords us the moſt expeditious, pleaſant, and advantagious way of gratifying our Senſes, and fulfilling our deſires in this moſt Innocent of Natural Practiſes.

1 *By Grafting.* The Fruits that are to be Grafted are the Apple, Pear, Cherry, Plum, and the Medlar; Filberds, Services, and Quinces, may alſo be Grafted.

Stock to Graft on. The firſt thing to be conſidered in Grafting, is the Stock; according to the nature of the Tree you intend to raiſe, muſt your Stock be; for Apples, the ſowrer the Stock is, the better is the Fruit: therefore the Crab-Stock is uſually preferred; they will be more free from the Canker, will become large Trees, and laſt longer: the Fruits alſo will be better, and harder on Crab, or ſowre Apple-ſtocks, than on ſweet.

For Apples.

For Pears. The beſt Stocks to Graft Pears on, are thoſe raiſed from the Kernel, or the wilde Pear-Tree; the White-thorn is not good.

For Cherries. Cherries prove beſt Grafted on the Black-Cherry-Stock, or the Merry-Stock, which may be raiſed in great quantities from the Stone.

For Plums. Plums are to be Grafted on Plum-Stocks, and no other.

For Medlars. Medlars may be Grafted on the White-thorn, but prove beſt on Pear-Stocks.

For Filberds, and Services. Filberds may be Grafted on the common Nut, and Services on their own kinde.

For Quinces. Quinces alſo may be Grafted on their own kinde.

2 *By Inoculation.* The Fruits that beſt ſucceed by Inoculation, are Aprecocks, Peaches, and Nectorines; Gooſberries and Currans, Plums, Apples, Pears and Cherries, may alſo be Inoculated with good ſucceſs; and ſeveral other ſorts of Fruits and Trees.

Aprecocks, &c. Aprecocks, Peaches, and Nectorines, are uſually Inoculated in Plum-Stocks, raiſed either from Suckers, or from Stones; thoſe of the white Pear-Plum are eſteemed the beſt; and thoſe of any other great white, or red Plum, that hath large leaves and ſhoots, are very good either to Graft or Inoculate other choice Plums upon, or for the budding of Aprecocks and Peaches;

but

but for a Nectorine, a Peach-Stock is moſt proper.

The Stones of Aprecocks and Peaches are not worth the ſetting, for Stocks to Inoculate with other good kinds, in reſpect their Roots are Spongy, and will neither laſt nor endure to be tranſplanted; therefore the Stones of Plums and Cherries are chiefly for that purpoſe to be regarded, except the Peach-ſtock for the Nectorine.

Gooſberries and Currans are Inoculated on their own kinde; and ſo are Plums, Apples, Pears, and Cherries. *Gooſberries, &c.*

SECT. IV.

Of the Nurſery for Stocks.

For the obtaining of a ſufficient number of Stocks to Graft and Inoculate the ſeveral ſorts of Fruits you intend to propagate and advance, and alſo to pleaſure your ſelf with ſuch that may be ſuitable for your intended purpoſe, and not to be enforced to rely on ſuch that the Country ſpontaneouſly affords, either for quantity or quality, prepare a Bed of Earth well dreſſed from Weeds, proportionable to the Seeds or Stones you intend to ſow, and therein ſow your Kernels of Crabs, or ſuch like Apples as you intend to raiſe your Stocks from, and cover them with Earth ſifted or raked over them, two or three fingers thick. This may be done about *October*, and ſo let lye till the Winter: For the Stones of Fruits, you may prick them down in Rows, two or three fingers deep, with the ſharp end downwards. You may alſo cover them with long Dung, or Straw, to keep them from the violence of Froſts, which in *April* you may take off, and in *May* they will come up; and being kept from Weeds, in two years will be ready to remove into other Beds prepared for that purpoſe; whereof they are to be planted at a more convenient diſtance, and better order, for the benefit of the Plant, and conveniency of the Grafter.

In *Autumn* is the moſt convenient time for this purpoſe, though it may be done at any time in the Winter, or Spring, before they bud: Let them be ſet in Rows, about two foot diſtance, or as beſt pleaſes your ſelf, and the Plants in each Row about ſix or eight inches apart, for the better conveniency of tranſplanting them; make the holes with an ordinary Setting-ſtick, and cut off the down-right Roots, and the Tops and Side-branches of the Plants, and faſten the Earth about them: Let not the Roots be too long, nor ſet deep, becauſe they are afterwards removed with more difficulty.

It is neceſſary to remove Seed-plants, for by that means they get good Roots, which otherwiſe they generally thruſt down one ſingle Root only.

The Nurſery thus ſet, may be ready after one year to Inoculate, and after two or three years to Graft.

Crab-ſtocks or Apple-ſtocks thus raiſed, are better than thoſe that come from the Woods, or any other ways. Let

Let the Kernels you raiſe your Nurſery from, conſiſt moſt, or altogether, of Crabs or Wildings for the Apple-Grafts.

Trees Grafted on a Gennet-Moyl or Cider-ſtock, preſerve beſt the Guſt of any delicate Apple; but on a Crab-ſtock the Tree laſts longer, and imparts a more Juicy and Tart reliſh, and ſo are to be preferred before moſt ſorts of Apples: The wilde Stock does enliven the dull and Phlegmatick Apple, and the Stock of a Gennet-Moyl ſweetens and improves the Pepin, *&c.* or may rather ſeem to abate ſome Apple over-tart and ſevere. The ſame Rules may be obſerved in the choice of Stocks for Pears, Plums, Cherries, Aprecocks, *&c.* the more Acid the Stock, the more life it gives to the Fruit of the Graft; as the black Cherry, or the Cherry-Tree, is the only Stock for the Cherry, *&c.*

Although the Fruit doth generally take after the Graft, yet is it ſomewhat altered by the Stock, either for the better or the worſe: as Apples or other Fruit Grafted on Stocks ſelect, as before, advance or meliorate them; ſo if they are Grafted on Stocks of another contrary Nature, much debaſeth the Guſt of the Fruit.

The Pear Grafted on a Quince-ſtock, produceth its Fruit better than the ſame kinde upon a wilde Pear-ſtock, and fairer; much better coloured, and the Trees to bear ſooner, and more ſtore of Fruits; for the Fruit not only receives ſomething of the Nature of the Stock, as well as the Graff, but alſo of the Soyl wherein they are planted, and of the Compoſt applyed unto them.

Therefore chuſe a plat of ground for your Seminary and Nurſery, that may be of an indifferent nature, not too much enriched with dung, nor too ſterile, lying warm, the Mould light, that the Stocks may the better thrive: Alſo let your Stocks be of Fruit ſelect, as before, for that purpoſe.

If you deſire to raiſe Dwarf-trees, let the Stocks whereon you Graff them, be of the *Paradiſe-Apple* for Apples, of the Quince for Pears, of the Morello, or common Engliſh Cherry, for Cherries; and ſo will they be the more fit for the Wall, or for Standards, being kept low according to the new Mode, though I ſee but little pleaſure or profit in that way.

The beſt way, and moſt expeditious to raiſe a great quantity of Quince-ſtocks for your Nurſery, is to cut down an old Quince-tree in *March*, within two inches of the ground, which will cauſe a multitude of Suckers to riſe from the Root: When they are grown half a yard high, cover them at the bottom a foot thick with good Earth, which in dry times muſt be watered; and as ſoon as they have put forth Roots, in Winter remove them into your Nurſery, where in a year or two they will be ready to Graft with Pears.

Plum-ſtocks and Cherry-ſtocks may be raiſed from Suckers, as well as from Stones, having regard to the kinds whence they proceed.

SECT.

SECT. V.

Of the Time and Manner of Grafting.

Having thus prepared your Nurſery, and raiſed a ſufficient quantity of Stocks to Graff or Inoculate on, you muſt conſider the ſeveral ways the ſeveral kinds of Fruits are to be propagated, and which are moſt ſuitable; and alſo the ſeveral times and ſeaſons wherein to Graff, and wherein to Inoculate.

1 *The time for Graffing.*

The times to Graff in, are moſt uſually in *February* and *March*; but I have grafted even unto mid-*April* ſome backward Fruits, and that with good ſucceſs. You may begin alſo in *January*, eſpecially with the more forward Fruits, as Plums, Cherries, *&c.* ſuch that have many to do, or much imployment other way, may begin more early, leſt they want time.

You may either Graff or Inoculate at any time of the year, except *October* and *November*, ſaith *Stephens*, the Author of the *Country Farmer*; but whether that may be practiſed with ſucceſs in theſe colder Countries, I much queſtion. But doubtleſs the temperature of the Seaſon doth very much conduce to the growth or proof of the Graff, as milde Weather in *December* or *January*, may be better for this work, than Froſty Weather in *February*. Froſty Weather at no time is fit to Graff in.

When the *Zephyres* of the *Spring* are ſtirring, chuſe that ſeaſon before all others for this work. Evelin's *Pomona.*

Make choice of your Graffs from a conſtant and well-bearing Branch, if conveniently you can; others may do very well. a *Choice of Graffs.*

The Graffs of ſuch Trees as are ill bearers, or not come to bear Fruit, are to be rejected, the Graffs always partaking of the quality of the Tree from whence they are taken.

Chuſe not thoſe that are very ſmall and ſlender, they commonly fail; but take the faireſt upon the Tree, and eſpecially thoſe that are fulleſt of Buds. Auſtin *of Fruit-trees.*

In *Herefordſhire* they do frequently chuſe a Graff of ſeveral years growth, and for the Graffing of ſuch large Stocks as are taken out of the Woods or Nurſeries, and fitted into Rows: for Orchards they chuſe not the Graffs ſo ſmall as in other Countries they require them.

Once for all, The ſtumpy Graff will be found much Superiour to the ſlender one, and make a much Nobler and larger ſhoot. This upon experience.

Graffs of any kinde being cut before they begin to ſpring, may be kept many days or weeks, and carried many Miles, being bound up in Moſs, the ends ſtuck in Clay or Earth, or being wrapped in oiled or waxen leather, or the ends ſtuck in a Turnep. 3 *The keeping of Graffs.*

Many Excellent Graffers aſſure us, that the Graff which ſeemed withered, and fit to be caſt away, hath proved the beſt when tryed: That the Graff a little withered and thirſty, is better received of the Stock.

Having

Instruments for Grafting. Having your Stocks and Graffs ready at the time convenient, together with your Tools, and other materials, as the Pruning-knife, Pen-knife, or other ſmall ſharp Knife to fit the Grafts withal, fine Saw, Mallet and Wedge, and alſo Ruſhes, or ſtrong ſoft Flags, or woollen Yarn to binde the Graft and Stock together, and Clay well tempered with Horſe-dung to keep the ſame from chopping in dry weather, or ſoft Wax for the ſmaller Trees, and a ſmall Basket to carry the Graffs in, with ſuch other Inſtruments and Materials as you ſhall judge neceſſary for your work, and ſuitable to the Method you intend to proceed in, or as your own Ingenuity ſhall direct, then may you proceed in ſome or one of theſe ſeveral ways or manners of Grafting: *Viz.*

Grafting in the Cleft. Either firſt by Grafting in the Cleft, which is the moſt known and Ancient way, and moſt uſual for the middle-ſiz'd Stocks; the manner thus: Firſt Saw off the head of the Stock in a ſmooth place; for Wall-trees or Dwarf-trees, within four fingers of the ground; for tall Standards higher, as you ſhall think convenient, or your Stock will give way: then pare away the roughneſs the Saw hath left on the head of the Stock; then cleave the head, (ſome adviſe a little beſides the pith) and put therein the Wedge to keep the Cleft open; which cut ſmooth with the point of your ſmall ſharp knife, that the ſides may be even: then cut the Graff on both ſides, from ſome Knot or Bud, in form of a Wedge, ſuitable to the cleft with ſhouldrings; which Graft ſo cut, place exactly in the Cleft, that the inward Bark of the Cion may joyn to the inward part of the Bark or Rind of the Stock cloſely, wherein lies the moſt principal skill and care of the Grafter, if he expects the ſucceſs anſwerable to his labours or expectation; then draw out the wedge: but if the Stock pinch hard, leſt it ſhould endanger the dividing of the Rinde of the Graff from the wood, to the utter ſpoiling of the Graff, let the inner ſide of the Graft that is within the wood of the Stock be left the thicker, that ſo the woody part of the Graff may bear the ſtreſs; or rather you might leave a ſmall wedge in the Stock to keep it from pinching the Graff too hard, and then may you leave the out-ſide of the Graff a little the thicker; which I have uſually done, as in ſmaller Stocks which pinch but weakly. Herein alſo is required care and judgment: then cover the head of the Stock with the tempered Clay, or with ſoft wax, to preſerve it, not only from the extremity of cold and drying winds, but moſt principally from wet.

Grafting in the Bark. The ſecond way of Grafting, and much like unto the former, is Grafting in the Bark or Rinde of the greater Stocks, and differs only in this, that where you cleave the Stocks, and faſten the Graffs within the Cleft in the other way, here you with a ſmall wedge cut tapering downwards, to a point thin, like unto a half round File, and made of Ivory or Box, or other hard wood; only force in the ſame wedge between the Rinde and Stock, after the head thereof is Sawn off, and the roughneſs pared away: then you are to take the Graff, and at the ſhoulder

or.

or groſſeſt part of it, cut it round with your ſmall Grafting-knife, and take off the Rinde wholly downwards, preſerving as much of the inner Rinde as you can; then cut the wood of the Graff about an inch in length, and take away half thereof to the pith, and the other half Taper it away, and ſet in the place you made with your wedge, between the Bark of the Stock and the wood, that the ſhouldring of the Graff may joyn cloſely to the Bark or Rinde of the Stock; and then with Clay and Horſe-dung cover it as you do the other.

This way is with moſt conveniency to be uſed when the Stock is too big to be cleft, and where the Bark is thick. Here you may alſo ſet in many Graffs in the ſame Stock, and with good ſucceſs.

Alſo eſpecial care is to be taken to keep the Tops of your Stocks covered from time to time, till the Bark it ſelf hath covered it, to prevent the Rains from rotting the Stock; yet (as Mr. *Evelin* ſaith in his *Pomona*) it has been noted, that many old Trees quite decayed with an inward hollowneſs, have born as full burdens, and conſtantly, as the very ſoundeſt, and the Fruit found to be more delicate than uſually the ſame kind from a perfect and more entire Stock.

Leave not your Graff above four, five, or at moſt ſix inches above the Stock; for being too long, they draw more feebly, and are more expoſed to the injuries of weather, and hurt by Birds, and proſper not ſo well: but herein regard is to be had to the greatneſs of the Stock, and its long continuance in the ſame place, and its ability to furniſh the Graff with Sap ſufficient.

Graff your Cions on that ſide of the Stock where it may receive the leaſt hurt from the South-weſt wind, it being the moſt common, and moſt violent that blows in Summer, ſo as the wind may blow it to the Stock, and not from it. Regard is here alſo to be had to the ſcituation of the Nurſery or place you Graff in.

Shoulder, or Whip-graffing.

The third way of Grafting that is made uſe of, and to be performed ſomewhat later than the other, and ſeems to be of later invention, becauſe it is not ſo generally taught and uſed as the former, is Shoulder or Whip-graffing, and may be done two ways. *Firſt way.* Firſt, by cutting off the head of the Stock, and ſmooth it as in Cleft-graffing; then cut the Graff from a Knot or Bud on one ſide, ſloping about an inch and a half long, with a ſhouldring, but not deep, that it may reſt on the top of the Stock. The Graff muſt be cut from the ſhouldring ſmooth and even, ſloping by degrees, that the lower end be thin: place the ſhoulder on the head of the Stock, and mark the length of the cut part of the Graff, and with your knife cut away ſo much of the Stock as the Graff did cover, (but not any of the wood of the Stock) place both together, that the cut parts of both may joyn, and the Saps unite the one in the other, and binde them cloſe together, and defend them from the Rain with tempered Clay or Wax, as before.

The ſecond way.

The other way of this Whip-graffing is where the Graffs and

Stocks are of an equal ſize, the Stock muſt be cut ſloping upwards from the one ſide to the other, and the Graff after the ſame manner from the ſhoulder downwards, that the Graff may exactly joyn with the Stock in every part; and ſo binde, and clay, or wax them, as before.

Theſe (eſpecially the firſt way) of Whip-graffing are accounted the beſt. 1. Becauſe you need not wait the growing of your Stocks; for Cleft-graffing requires greater Stocks than thoſe ways. 2. This way injureth leſs the Stock and Graff than the other. 3. The wound is ſooner healed, and thereby better defended from the injury of the Weather, which the Cleft-ſtock is incident unto. 4. This way is more facile, both to be learned and performed.

Graffing by Approach.

The fourth way of Graffing is by Approach or Ablactation; and this is performed later than the former ways, to wit, about the Moneth of *April*, according to the ſtate of the Spring. It is to be done where the Stock you intend to Graff on, and the Tree from which you take your Graff ſtand ſo near together, that they may be conjoyned; then take the Sprig or Branch you intend to Graff, and pare away about three inches in length of the Rinde and Wood near unto the very Pith; cut alſo the Stock or Branch on which you intend to Graff the ſame after the ſame manner, that they may evenly joyn each to other, and that the Saps may meet; and ſo bind them, and cover them with Clay or Wax, as before.

As ſoon as you perceive the Graff and Stock to unite, and be incorporated together, cut off the head of the Stocks (hitherto left on) four inches above the binding, and in *March* following the remaining ſtub alſo, and the Cion or Graff underneath, and cloſe to the grafted place, that it may ſubſiſt by the Stock only.

Some uſe to cut off the head of the Stock at firſt, and then joyn the Cion thereunto, after the manner of Shoulder-grafting, differing only in not ſevering the Cion from its own Stock: Both ways are good, but the firſt more ſucceſsful.

This manner of Grafting is principally uſed in ſuch Plants that are not apt to take any other way; as *Oranges*, *Lemons*, *Pomgranats*, *Vines*, *Geſſamins*, *Althea-frutex*, and ſuch like. By this way alſo may attempts be made to Graff Trees of different kinds, one on the other, as Fruit-bearing Trees on thoſe that bear not, and Flower-trees on Fruit-trees, and ſuch like. I have alſo by this inverted the top of a Cion downwards into the Stock, which hath taken; and afterwards cut off the Graff three or four buds above the Stock, which grew, although but ſlowly, by means of the Sap being forced againſt its uſual Current.

Theſe are the moſt uſual ways of Grafting: ſome other there are, but they differ ſo little from the former, and where they differ its rather for the worſe; and therefore not worthy the mentioning.

Thoſe Graffs that are bound, you muſt obſerve to unbinde them towards *Mid-ſummer*, leſt the Band injures them.

Where

Where their heads are ſo great that they are ſubject to the violence of the Winds, it's good to preſerve them, by tying a ſtick to the Stock, which may extend to the top of the Graff, to which you may binde the Graff. The firſt year the beſt thriving Graffs are moſt in danger; afterwards they rarely ſuffer by the Winds.

Graffs are alſo ſubject to be injured by Birds; which may be prevented, by binding ſome ſmall Buſhes about the tops of the Stocks.

There is another way of Graffing lately invented, which is by taking a Graft or Sprig of the Tree you deſigne to propagate, and a ſmall piece of the Root of another Tree of the ſame kinde, or very near it, and Whip-graft them together, and binde them well, and plant this Tree where you intend it ſhall ſtand, or in a Nurſery; which piece of root will draw ſap, and feed the Graft, as doth the Stock after the other ways. *A new way of Graffing.*

You muſt obſerve to unite the two Butt-ends of the Graff and Root, and that the rinde of the Root joyn to the rinde of the Graft.

By this means the Roots of one Crab-ſtock or Apple-ſtock will ſerve you for 20 or 30 Apple-grafts: And in like manner of a Cherry or Merry-ſtock for as many Cherry-grafts; and ſo of Pears, Plums, *&c.*

Thus may you alſo raiſe a Nurſery of Fruit-trees inſtead of Stocks, by planting them there, when they are too ſmall to be planted abroad, where they are ſubject to prejudice.

This way, more than any other, is beſt for the raiſing of tender Trees that will hardly endure the Grafting in the Stock; for here they are not expoſed to the injuries of Sun, Wind or Rain.

It is alſo probable, that Fruits may be meliorated by Grafting them on Roots of a different kinde, becauſe they are more apt to take this way than any other.

The Trees thus Grafted will bear ſooner, and be more eaſily Dwarfed than any other, becauſe part of the very Graft is within the ground; which being taken off from a bearing ſprig or branch, will bloſſom, and bear ſuddenly, in caſe the Root be able to maintain it.

The only Objection againſt this way is this, that the young Tree grows ſlowly at the firſt, which is occaſioned by the ſmalneſs of the Root that feeds the Graff; for in all Trees the Head muſt attend the encreaſe of the Root, from whence it hath its nouriſhment.

Nevertheleſs this work is eaſily performed, Roots being more plentiful than Stocks, and may be done in great quantities in a little time within doors, and then planted very eaſily, with a ſlender Dibble in your Nurſery, and will in time infinitely recompence your pains.

SECT. VI.

Of the Time and Manner of Inoculation.

Next unto Graffing, Inoculation takes place; by ſome preferred before any of the ways of Graffing before treated of: It differs from the other ways in this, that it's performed when the Sap is at the fulleſt in the Summer; and the other ſorts of Graſting are before the Sap aſcends, or at leaſt in any great quantity. Alſo by this way of Inoculation may ſeveral ſorts of delicate Fruits and Trees be propagated and meliorated, which by Grafting cannot be done, unleſs in the laſt way before-mentioned. As the Aprecock, Peach, or Nectorine, rarely thrives any other way than this, becauſe few Stocks can feed the Graff with Sap ſo early in the Spring as the Graff requires it, which makes it fruſtrate your expectation; but being rightly Inoculated in the fulneſs of the Sap, rarely fails.

The Stocks on which you are to Inoculate, are to be of the ſame kinde, as before was directed to Graff on.

The Peach takes beſt on its own kinde; but the Nectorine thrives not well, unleſs upon a Peach-ſtock.

1 *The time for Inoculation.* The time for this work is uſually from *Midſummer* to the middle of *July*, when the ſap is moſt in the ſtock. Some Trees, and in ſome places, and in ſome years, you may Inoculate from mid-*May* to mid-*Auguſt*. As to the time of the day, it is beſt in the Evening of a fair day, in a dry ſeaſon; for Rain falling on the Buds before they have taken, will deſtroy moſt of them.

2 *The choice of Buds.* The Buds you intend to Inoculate muſt not be too young nor tender, but ſufficiently grown: The Aprecock Buds are ready ſooneſt; they muſt be taken from ſtrong and well-grown ſhoots of the ſame Year, and from the ſtrongeſt and biggeſt end of the ſame ſhoots.

If Buds be not at hand, the ſtalks containing them may be carried many miles, and kept two or three days, being wrapt in freſh and moiſt Leaves and Graſs, to keep them cool. If you think they are a little withered, lay the ſtalks in cold water two or three hours; and that, if any thing, will revive them, and make them come them off the ſtocks.

3 *Inſtruments for Inoculation.* Having your Buds and Inſtruments ready for your work, *viz.* a ſharp-pointed Knife or Pen-knife, a Quill cut half away, and made ſharp and ſmooth at the end to divide the Bud and Rinde from the Stalk; and Woollen Yarn, or dry Ruſhes, Flags, or ſuch like, to binde them withal: Then,

4 *The manner of Inoculation.* On ſome ſmooth part of the ſtock, either near or farther from the ground, according as you intend it, either for a Dwarf-tree, or for the Wall, or a tall Standard, cut the Rinde of the ſtock overthwart; and from the middle thereof, gently ſlit the Bark or Rinde, about an inch long, in form of a T, not wounding the ſtock; then nimbly prepare the Bud, by cutting of the leaf, and

leave

leave only the Tail about half an inch from the Bud; then ſlit the Bark on each ſide the Bud, a little diſtance from the Bud, and take away the Bark above and below, leaving the Bark half an inch above and below the Bud, and ſharpen that end of the Bark below the Bud, like a Shield or Eſcutcheon, that it may the more eaſily go down, and unite between the bark and the ſtock: Then with your Quill take off the bark and bud dexteroully, that you leave not the root behinde; for if you ſee a hole under the bud on the inſide, the root is gone, caſt it away, and prepare another. When your bud is ready, raiſe the bark of the ſtock on each ſide in the ſlit, (preſerving as carefully as you can the inner thin rinde of the ſtock) put in with care the ſhield or bud between the bark and ſtock, thruſting it down until the top joyn to the croſs cut; then binde it cloſe with your Yarn, *&c.* but not on the Bud it ſelf.

There is another way of Inoculation more ready than this, and more ſucceſsful, and differs from the former only that the bark is ſlit upwards from the croſs cut, and the ſhield or bud put upwards, leaving the lower end longer than may ſerve; and when it is in its place, cut off that which is ſuperfluous, and joyn the bark of the bud to the bark of the ſtock, and binde it as before; which ſooner and more ſucceſsfully takes than the other, as I my ſelf have experienced. *Another way to Inoculate.*

I have alſo cut the edges of the bark about the bud ſquare, and have cut the bark of the ſtock fit to receive the ſame, and bound it faſt; which ſucceeded well, and is the readier way, and more facile. *Another way.*

About three weeks or a moneths time after your Inoculation, you may unbinde the buds, leſt the binding injure the bud and ſtock.

When you unbinde them, you may diſcern which are good, and have taken, and which not; the good appear Verdant, and well coloured, the other appear dead and withered.

In *March* following cut off the ſtock three fingers above the bud; and the next year cut it cloſe, that the bud may cover the ſtock, as Graſſs uſually do.

SECT. VII.

Of raiſing Fruit-trees by the Seeds, Stones, Nuts, or Kernels.

We have given you a ſhort Survey of ſuch Fruits as are propagated by Grafting and Inoculation, and the way or method of promoting the ſame. Now we are to touch upon ſome few Trees or Fruits that are raiſed from their own Seed or Kernel, as Almonds, Services, Wall-nuts, and Filberds. Some others there are, as Oranges, Lemons, and ſuch like, not neceſſary for our Rural Theatre; therefore I ſhall ſay little to them.

But the only known and beneficial way to propagate the Wall-nut-tree, *Wall-nuts.*

nut-tree, is from the Nut; which from the time of gathering of them you may keep, and preſerve in Beds of Sand or Earth till *March*; and then plant them, if you can, in the places where they are to abide; for ſo will they proſper exceedingly, and much more than any removed: but if you remove any, be cautious of cutting the branches or roots, leſt you endanger the Tree.

Be careful to preſerve the Nuts from Mice; for if they can come at them, you will have but few left. Although I planted ſome hundreds in their Husks, and a great number of them wrapped in Clay, yet were all to a very few tranſplanted by the Mice.

Filberds. Filberds alſo may be raiſed from the Nut, and are eaſier obtained, and carried farther, than the Suckers or Plants of the ſame Tree, and are raiſed and ordered as Wall-nuts are.

Almonds. It's the beſt and moſt uſual way alſo to raiſe Almond-trees from the ſtone, which muſt be ſet in the place they are to abide, not eaſily growing after a remove.

Cheſnuts, and Services. Cheſnuts and Services are alſo raiſed from the Fruit of them, by being ſown in your Seminary, and thence removed.

SECT. VIII.

Of raiſing and propagating Fruit-trees, by Layers, Slips, and Suckers.

There are alſo ſeveral ſorts of Fruits that are to be raiſed with more advantage and facility from Layers, Slips or Suckers, than from Graffing, Inoculation, or from the Seed; and ſuch are Codlings, Gennet-Moyls, Quinces, Filberds, Vines, Figs, Mulberries, Gooſberries, Currans and Barberries.

Codlings. The *Kentiſh* Codling is very eaſily propagated by ſlips or ſuckers, and is of ſo good a nature as to thrive being ſet very near, that they make a very ornamental hedge, which will bear plentifully, and make a moſt pleaſant proſpect; the fruit whereof, beſides the ordinary way of ſtewing, baking, *&c.* being very early, makes a delicate Cider for the firſt drinking.

Theſe Trees ought not to be topt or plaſhed, as is uſual, they growing tall and handſom, which if topt decay, and grow ſtubby and unpleaſant; neither do they bear ſo well.

Gennet-Moyls. The Gennet-Moyl-Tree will be propagated by Slips or Cions, as is the Codling, but is not ſo apt to grow in a hedge as the other: Both of them bear ſooner, if grafted, as other Apples are.

Quinces. The manner of raiſing the Quince we have already diſcourſed, where we treated of raiſing Stocks to Graff on.

Filberds. Filberds are generally drawn as Suckers from the old Trees, and will proſper very well, and ſooner come to be Trees, than from the Nut.

The Vine. Any ſhoot of the laſt year, more eſpecially if a ſhort piece of the former years growth be cut with it, will grow, being laid about a foot or eighteen inches within the ground long-ways, and not above two or three Buds at moſt out of the ground, about the

the moneth of *February*, and watred well in the drought of Summer.

The Fig-tree yieldeth Suckers, which is the uſual way to multiply them. *Figs.*

The Mulberry is a very difficult Tree to raiſe, and is beſt done thus: Cut a Bough off as big as a mans Arm, and cut it in pieces a yard long, or leſs: lay all theſe in the ground a foot deep, only one end out of the ground about a hands breadth; let it be in fat and moiſt ground, or uſually watred; and after a year or two divers young Springs may be drawn with Roots, and planted at a diſtance, and the old Roots will yet ſend out more. *Mulberries.*

Theſe three kinds of Fruits yield ſuch plenty of Suckers, that you never need doubt of a ſupply. *Gooſeberries, Currans, and Barberries.*

But if you deſire Plants from the ſame, or any other ſorts of precious Fruits or Plants, and where you cannot obtain Suckers from the Roots, and where the branches will not eaſily take root, being ſeparated from the Tree, you may obtain your deſire by bending down ſome branch of the Tree to the ground; and with a hooked ſtick thruſt into the ground, ſtay the ſame in its place, and cover the ſame branch with good Earth, as thick as you ſhall think fit, and keep the ſame well watred; or if you cannot bring the branch to the Earth, you may have ſome Earthen pot, Basket, or ſuch like, with a hole in the bottom, and faſten the ſame to the wall (if againſt a wall) or on ſome Poſt or Stake: Put the Sprig or Branch you intend to plant through at the hole, and fill the ſame with good Earth, and water it often as before: Some prick the Rinde that is in the Earth full of holes, that it may the better iſſue thereout ſmall Roots; others adviſe to cut away the Bark. This may be done in the Spring, from *March* to *May*, and the Plant will be fit to cut off below the Earth the Winter following. By this means you may obtain the Plants of Vines, Mulberries, or any manner of choice Fruits or Plants. *To lay the Branches of Trees.*

SECT. IX.

Of the Tranſplanting of Trees.

The beſt and moſt ſucceſsful time for the tranſplanting or removing of Trees (ſuch that ſhed their leaves in the Winter) whether they are the young Stocks, or new Grafted Trees, or of longer ſtanding, is in the Autumnal Quarter, when the Trees have done growing: about the end of *September* you may begin; the prime time is about the middle of *October*. You may continue till the Tree begins to bud, if the weather be open. 1 *The time to tranſplant.*

Be careful in taking up the Plants, that requiring great care of the Remover. See the Roots be left on as much as may, eſpecially the ſpreading Roots, and let the Roots be larger than the head, the more ways they ſpread the better; but you may take away ſuch Roots as run downwards: Alſo take off the leaves, if any, leſt they weaken the Branches by extracting the Sap. 2 *The manner of tranſplanting.*

The

The younger and leſſer the Tree is, the more likely he is to thrive and proſper, becauſe he ſuffers leſs injury by the removal than an older or greater Tree: And an Orchard of young Trees will ſoon overtake another planted with larger Trees at the ſame time.

Plant not too deep, for the Over-turf is always richer than the next Mould: And in ſuch places where the Land is Clayiſh, over-moiſt, or Spewy, plant as near the Surface as you can, or above it, and raiſe the Earth about the Tree, rather than ſet the Tree in the wet or Clay. The ſame Rule obſerve in Gravelly or Chalky Land, for the Roots will ſeek their way downwards, but rarely upwards: That I have known Trees planted too deep pine away, and come to nothing. This Rule obſerved, many places may be made fruitful Orchards that now are judged impoſſible, or not worth ones while.

In the tranſplanting of your young Trees, you may Prune as well the branches as the roots, taking away the tops of the branches of Apples and Pears, but not of Plums, Cherries, nor of Wall-nuts.

The Coaſt alſo is neceſſary to be obſerved, eſpecially if the Tree be of any conſiderable bigneſs, that the ſame ſide may ſtand South that was South before, the Tree will thrive the better: Although in ſmall Trees it be not much obſerved, yet it might prove none of the leaſt helps to its growth and thriving. The moſt facile way to preſerve the memory of its ſcituation, is to mark the South or North ſide of the Plant with Oker, Chalk, or ſuch like, before you remove it.

It is not a ſmall check to a Plant, to be removed out of a warm Nurſery into the open Field, where the Northern and Eaſtern Winds predominate; or its ſhelter to be removed, as by the cutting down of Hedges, and other Trees that formerly defended them.

It is alſo very neceſſary to be obſerved, that the ground into which you plant your Tree be of a higher and richer Mould than from whence you removed it, if you expect your Tree to thrive; the change of Soyls or Paſtures, from the worſer to the better, being of very high concernment for the improvement and advance of all Vegetables and Animals.

Theſe, and ſeveral other the like Obſervations, if they can be obſerved, will much advantage the growth of your Tree for the firſt year or two; but if place and time, and other accidents will not admit thereof, in a ſhort time the Plant may by the care and diligence of the Planter, overcome thoſe inconveniencies or obſtructions.

Let not the Ground wherein you plant Apples be too much enriched with Dung, they requiring rather a vulgar and ordinary light Mould.

3 *The diſtance of Trees.* According to the nature or quantity of your ground or Trees may the diſtance be; but the uſual diſtance, and moſt convenient for Apple-trees or Pear-trees for an Orchard, may be from twenty

ty to thirty foot, if you expect the benefit of the Land, under and between them, either for Grass or Tillage, or that you plant them in your Fields or Pastures; then from thirty to sixty foot may your distance be: The farther distance they are, the more benefit and refreshment do they receive from the Sun and Air; the Fruit are much the better, and the Trees prosper the better also: And if they are too near together, the ground is for the most part of no advantage under them, neither do the Trees thrive so well, nor are so fertil.

Cherry-trees, Plum-trees, Quince-trees, and such like, may be planted about fifteen or twenty foot distance, which is sufficient.

Wall-trees may be planted at such a distance, as the height or bredth of the Wall, the nature of the Tree, and the nature of the ground requires: the higher the Wall, the nearer together the Trees; and the lower the Wall, the farther distance, that they may have the room to spread in bredth which they want in height. Vines require a more spacious and ample Wall or place to spread against than any other Fruit; next to that the Pear, then the Aprecock, the Peach, the Nectorine, and then the Cherry, the May-cherry, *&c.*

For the distance of other small Trees, as Filberds, Gooseberries, Currans, *&c.* you may plant them at such convenient distance, that the branches may not intangle the one in the other, according to your own discretion.

Codlings, Cherries, Plums, *&c.* may be planted to make hedges withal, and then are to be planted near together: the nearer, the sooner it will be a hedge; the farther distance, the more Fruit will they bear, but not so soon a hedge.

If you designe to fill your Plat of Ground with all sorts of Fruits for your greatest advantage, then plant several Rows of Apples and Pear-trees at a convenient distance in each Row, but the Rows of a farther distance each from the other; and then about ten or fifteen foot on each side the Rows of the greater Trees, plant a Row of Cherries, Plums, or such like Trees, of a lesser stature or growth, and nearer together than the Apple or Pear-trees: Next unto them also, at a convenient distance, a Row of Filberds; and next unto them Gooseberries, Currans, Rasberries, or such like small Fruit, leaving only a Walk between the lesser Trees: For by this means will the whole ground be supplied; and by that time that the greater Trees are grown to any competent stature, the lesser will be decayed, that the greater Trees may have the sole Predominancy.

But the most compleat order in the planting of an Orchard of the larger Fruit-trees, is that which they term the *Quincunx*, by planting them at an equal distance every way, only with this observation, that every Tree of the second Row may stand against the middle of the space of the first, in the third against the space of the second, and so throughout; which makes it appear pleasing to the eye, in what part of the Orchard soever you stand.

In planting of Trees observe this Rule, that if the crooked-

neſs of the Tree will inforce you to plant it leaning, or tending any way, let it be to the Weſt, from whence the ſtrongeſt winds blow, or to ſuch Coaſt your Orchard is moſt obvious.

SECT. X.

Of the Pruning of Trees.

It conduceth very much to the proof and growth of a Tree to be Pruned, or the unneceſſary and injurious branches to be taken off by the skilful hand of the Husbandman.

1 *The pruning of young Trees.* When your Graffs are grown half a Yard high, thoſe you finde to ſhoot up in one Lance, pinch off their tender tops; which will prevent their mounting, and cauſe them to put forth ſide-branches. It's found to be the beſt way to guide a Tree either to grow, or extend it ſelf in height, or to cauſe it to ſpread in bredth: It gives not that wound to Trees that Inciſions or Lances uſually do; and beſides, this may be done at that ſeaſon, when the taking away of a Bud prevents the expence of Sap in waſte, and diverts its courſe to others neceſſary to remain.

In *March* is the beſt time to take away the ſmall and ſuperfluous branches, giving the Lance cloſe behinde a Bud, a thing to be ſpecially obſerved in Pruning.

2 *Of wall-trees.* Wall-trees are to be pruned in the Summer, and in the Winter. In the Summer about *June* or *July*, you may take of ſuch ſuperfluous ſprigs or ſhoots of the ſame years growth off from Vines, Aprecocks, or other Trees that put forth many large ſhoots, that impede the Fruit from its due Maturation, and contract much of the ſap of the Tree to themſelves, and thereby rob the other.

In the Winter, as ſoon as the leaves are off the Trees, you may Prune and cut away the reſidue of the branches, and place thoſe that are fit to be left in order. This work may be continued throughout the Winter to the riſing of the Sap, except in great Froſts, when it is not good to wound the Vine, or any other tender plant. Some hold *February* to be the beſt time to plaſh, prune, and nail Trees, after the great Froſts are paſt, except *Peaches* and *Nectorines*; which being cut before the riſing of the Sap, are apt to die after the Knife, and ſo ſtump and deform the Tree: Therefore ſuch muſt be left till they begin to put forth Buds and Bloſſoms.

3 *The pruning of old Trees.* The greater Trees in your Gardens, Orchards, Fields, *&c.* may be pruned in *October*, *November*, or thenceforward, to the riſing of the Sap. Obſerve to cut away ſuperfluous branches, ſuch as croſs one the other, as grow too thick, or that offend any other Tree or place, or that are broken, bruiſed, or decaying; the Tree will be the better preſerved, and the remaining branches will yield the greater increaſe.

Other obſervations in pruning Trees. In Pruning of Trees, eſpecially the Wall-tree, be ſure to leave the ſmall Twigs that are ſhort and knitted to bloſſom the ſucceeding year; for you may obſerve, that moſt Aprecocks, Peaches, Plums,

Plums, Cherries, *&c.* hang on thoſe Sprigs, being uſually of two years growth: Theſe are therefore to be carefully nouriſhed, and not cut off, as is uſual, to beautifie the Tree. By this very Obſervation your Walls ſhall be full of Fruit, when your Neighbours have but few.

In Wall-fruit cut off all groſs ſhoots, however fair they ſeem to the eye, that will not without much bending be well placed to the Wall; for if any branch happen to be wreathed or bruiſed in the bending or turning (which you may not eaſily perceive) although it doth grow and proſper for the preſent, yet it will decay in time; the Sap or Gum will alſo ſpew out in that place. By neglect of this Obſervation, many ſeeming fair Trees decay in ſeveral parts, when the Husbandman is ignorant of the cauſe.

In Pruning the Vine, leave ſome new branches every year, and take away (if too many) ſome of the old; which much advantageth the Tree, and encreaſeth its fruit.

When you cut your Vine, leave two knots, and cut at the next interval; for uſually the two Buds yields a bunch of Grapes. I have obſerved Vines thus pruned to bear many fair bunches, when cut cloſe, as uſually is done for Beauty ſake (which by the Husbandman is not in this caſe to be regarded) the Tree hath been almoſt barren of Fruit.

When you cut any Pithy Tree, the Vine eſpecially, make your Lance, if the Sprig be upright, on the North-ſide; if ſloping, then make your Lance under, or on one ſide, that the wet or Rain lodge not on it, nor decay the Pith, which uſually damniſies the next Bud, and ſometimes more.

SECT. XI.

Other neceſſary Obſervations about Fruit-trees.

Where the ground is ſhallow, or lieth near Gravel, Clay, Stone or Chalk, or near the Water, take the top of one half of the ſame Land, and lay it on the other in Ridges, abating the intervals like unto Walks, and plant the Trees on the midſt of the *Ridges*; by which means they will have double the quantity of Earth to root in that they had before, and the Walks or Intervals preſerve the Ridges from ſuperfluous moiſture. It hath been found an approved Remedy in dry ſhallow Land, as well as in low wet Land. 1 *Of the raiſing of Land.*

It hath been obſerved, that Pear-trees will thrive and proſper in cold, moiſt, hungry, ſtony, and gravelly Land, where Apples will not bear ſo well. *Pear-trees.*

The Roots of ſuch Trees that thrive not, nor bear well, may be laid open about *November*; and if the ground be poor and hungry, then towards the Spring apply good fat Mould thereto; but if the ground be over-fat and rich, that the Tree ſpends it ſelf in Branches and Leaves with little Fruit, then apply to the 2 *Of the ordering the Roots of old Trees.*

Roots, Aſhes or Lime, or any of the Compoſts that are ſalt, hot and dry, mixed with the Earth, which contain more of fertility than the ordinary Dung.

Alſo laying ſtore of any manner of Vegetables all the Summer about the roots of Fruit-trees, to kill the Graſs and Weeds growing about the Tree, it keeps the ground moiſt and cool, and adds much to the flouriſhing and fertility of the Tree, and is the beſt Natural Remedy againſt the Moſs; ſo that it lye not too near the Tree, to decay the Bark thereof.

Digging or Ploughing about the Roots of Fruit-trees, adds much to their fertility, and prevents the Moſs in moſt Trees.

Stones laid in heaps about the Roots, preſerves them cool and moiſt in the Summer, and warm in Winter; and is of great uſe and concernment to the fertility and advance of the growth of Fruit-trees.

3 *Alteration of ground.* The ground wherein you plant your Fruit-trees, if you finde it not ſuitable to the Nature of the Tree, may be ſeveral ways altered as before: and by the applying of Earth, Clay, or Sand, of a divers Nature from the ground where the Tree grows.

4 *Defending Trees from winds.* If your Orchard or Garden be not naturally well ſcituate, and defended from the injurious winds by Hills or Woods; or that Buildings, Barns, Walls, or ſuch like, are not conveniently ſcituate near to preſerve it, it is of great advantage to raiſe a perpetual, laſting, and pleaſant ſhelter, by planting a compleat *White-thorn.* Thorn-hedge about the ſame at the time, or in that Year you firſt plant your Orchard or Garden, which will grow in a few years to a conſiderable height, and very much break the cold winds, and preſerve the ſmaller and lower part of the greater Trees, in their bloſſoming and kerning time, from the nipping winds: But for that, that the principalleſt parts of the greater *Wallnut-tree.* Trees exceed the Summity of the White-thorn, the Wallnut-tree raiſed in time on the borders or naked ſides of the Orchard or Garden, and if you can on the out-ſides of the Fences, will prove a Noble and profitable defence from the furious winds.

If you regard not the Fruit or profit, ſo much as the pleaſure and ſudden riſe of ſuch a defence, that which is moſt facile and *Poplar.* expeditious to be raiſed is the Poplar, which may be planted near together, and ten or fifteen foot in height the firſt year, which will prove and thrive wonderfully, eſpecially if the ground be any whit inclineable to moiſture.

Lime-tree. Or the Lime-tree, if you can conveniently obtain them, make a cloſe and ſecure defence from the winds, and of all other is the moſt odoriferous, regular, and delicious verdant palé to a Garden or Orchard. The Sycamore, and the Elm alſo are not to be rejected; only the Elm hath an ill name, as being ſubject to raiſe or attract Blights.

5 *Raiſing Stocks.* At the removal of Trees, the trimmings of the roots planted, or rather buried in the ground within a quarter of an inch, or little more of the level of the Bed, will ſprout and grow to be very good Stocks.

Pigeons

Pigeons dung, or the dung of Poultry, or any Fowl, being of a hot, dry, and ſalt Nature, hath been experimentally found to be the Soyl moſt conducing to fertility for Fruit-trees, eſpecially in cold grounds. *6 Soyl for Fruit-trees.*

It is uſual to ſelect aſpiring Trees, and to expect the fairer Trees (becauſe taller) and better and more Fruit, than thoſe that are low. 'Tis true, the more remote the branches are from the Earth, the leſs are they ſubject to the injuries of Cattel, or the Fruit to light fingers. *7 Height of Trees.*

But the lower the Tree brancheth it ſelf and ſpreads, the fairer and ſooner will it attain to be a Tree, and the greater burthen will it bear of Fruit, and thoſe better and larger. The Tree and Fruit will alſo be leſs obvious to the furious winds, which make havock moſt years of a great part of our ſtock; and in the Spring the new-kerned Fruit will be more within the ſhelter of the Natural or Artificial Securities from the nipping cold morning Breeſe; and the Fruit, when ripe and apt to fall, will not receive ſo great injury from the humble, as from the aſpiring Tree. *Sed medio Virtus.* As the tall Tree is not for your advantage; ſo the Tree that's too low is not for your conveniency. I aim not at Extremes.

In many places Fruit-trees are much injured by Moſs; it rately grows on Trees where the ground is yearly digged, ploughed, or otherwiſe preſerved from Graſs or Weeds, as we noted before. If the cold, moiſt, or barren nature of the ground be the cauſe, then rectifie the ſame, as before. After Rain you may ſcrape off the Moſs with a knife, or rub it off with a Hair-cloth. *8 Diſeaſes of Trees. Moſs.*

If the Tree be Bark-bound, and thrive not well, with a knife you may ſlit the Bark down the body of the Tree in *April* or *May*, and it will cure it. *Bark-bound.*

If the Cleft where the Tree was grafted, or any other wounded place be neglected, the Rain is apt to ingender the Canker: the cure is difficult, if too far gone. There are many preſcriptions for the cure of it; but if the cutting off of the Canker or cankered branches will not cure it, and the Tree be much infected with it, the beſt way is to place a better in the room. *Canker.*

Some Trees are hurt with ſmall Worms that breed between the bark and wood, which makes the bark ſwell: cut away part of the bark, and waſh with Urine and Cow-dung. *Worms in the Bark.*

Strong or hot dung is not good for Fruit-trees; but after it is throughly rotten and cold, it may be mixed in cold grounds with ſucceſs, but in rich or warm Land. Any dirt or ſoyl that lies in ſtreets or high-ways, where it may be had, is beſt, eſpecially for the Apple-tree. *Soyl for Trees.*

Commonly Husbandmen apply Soyl, Fern, *&c.* to the ſtems of their Trees; and if they dig to apply it, it is uſually near the body of the Tree, which will not anſwer the trouble; for the Roots that feed the Tree, ſpread far from the Trunk or Stem: therefore the ſoyl that is to be applied ſhould be laid at a convenient diſtance proportionable to the ſpreading of the Roots; wherein *How to apply Soyl to Trees.*

wherein the long ſtanding of the Tree is to be conſidered; digging about, the roots of Trees ſhould alſo be uſed accordingly.

In planting of Trees, it's uſual to apply good Mould, or other additional ſoyl, to fill up the Foſs after the placing the Tree; which conduceth not ſo much to the proſperity of the Plant, as to place the better Mould or ſoyl in the bottom of the Foſs, and then plant your Tree on it, ſpreading its roots over the good ſoyl; for all roots of Plants as naturally tend downwards and ſide-ways, as the branches ſpread and advance upwards: So that the ſoyl that lies above the roots, only yields ſome fatneſs which the Rain waſheth down unto them; but the ſoyl that is under, the roots flouriſh in it. The difference, in this caſe, may at any time be ſenſibly perceived by the experienced.

SECT. XII.

Of the uſe and benefit of Fruits.

Not any of the afore-mentioned Fruits, but are very pleaſant, neceſſary, and profitable to many of our Engliſh Palats and Purſes; the moſt of them being a familiar food to the Noble and Ignoble. Theſe extend their vertue alſo to the cure of many infirmities or diſeaſes, being judiciouſly applied.

But over and above their uſe for food, for pleaſure, and for Phyſick, to be converted into ſo many ſeveral ſorts of curious, pleaſant, palatable, and laſting Liquors, is not the leaſt of the benefits accrewing unto the Husbandman from the diverſity of Fruits by him propagated. Next unto Wine (whereof we treat not in this place) Cider is eſteemed the moſt pleaſant natural Liquor our Engliſh Fruits afford.

1 *By Cider.* Several are the ways uſed in making this excellent Liquor, and that according to the skill of the Operator, and divers kinds of the Fruit whereof it is made.

Cider-fruits may be reduced into two ſorts or kinds; either the wilde, harſh, and common Apple, growing in great plenty in *Hereford*, *Worceſter*, and *Glauceſterſhire*, and in ſeveral other adjacent places in the fields and hedg-rows, and planted in ſeveral other places of *England* for Cider only, not at all tempting the Palate of the *Thief*, nor requiring the charge and trouble of the more reſerved incloſures.

Or the more curious Table-fruits, as the *Pippin*, *Pearmain*, *&c.* which are by many preferred to make the beſt Cider, as having in them a more Cordial and pleaſant Juice than other Apples.

Cider-fruits. For the former, the beſt ſorts for Cider are found to be the *Red-ſtreak*, the *White-Muſt*, and the *Green-Muſt*, the *Gennet-Moyl*, *Eliots*, *Stocken-Apple*, *Summer-Fillet*, *Winter-Fillet*, &c.

The greater part of them being meerly ſavage, and ſo harſh, that hardly Swine will eat them, yet yielding a moſt plentiful, ſmart and winy Liquor, comparable, or rather exceeding the beſt French-Wines: And for the advantage of planting them, they

they claim a preference before Pippins, or any other of our pleasant Garden-fruits, especially the *Red-streak*, which Mr. *Evelin* so highly commends, as at three years grafting to give you fair hopes, and last almost an hundred years; and will bear as much Fruit at ten years, as *Pippins* or *Pearmains* at thirty.

The best sorts of Cider-fruit are far more succulent, and the Liquor more easily divides from the Pulp of the Apple, than in the best Table-fruit.

Some observe, the more of red any Apple hath in his rinde, the better for Cider; the paler, the worse. No sweet Apple that hath a tough rinde, is bad for Cider.

Making of Cider.

Cider-Apples require full maturity, e're they be taken from the Trees: And after they are gathered (which is to be done with as much caution as may be, to preserve them from bruises) it very much conduces to the goodness and lasting of the Cider, to let them lye a week or two on heaps out of the Rain and Dew: the harsher and more solid the Fruit is, the longer may they lye; the more mellow and pulpy, the less time. This makes them sweat forth their Aqueous Humidity, injurious to the Cider, and matureth the Juice remaining, and digesteth it more than if on the Tree, or in the Vessel: But it's probable they will yield more from the Tree than so kept, but not so good.

Such that are Wind-falls, bruised, or any ways injured, or unripe fruit, divide from the sound and mature. It's better to make two sorts of Cider, the one good, the other bad, than only bad. Take away all stalks, leaves, and rotten Apples; the stalks and leaves give an ill taste to the Cider, the rotten Apples makes it deadish.

Let such that are through casualty, or otherwise fallen from the Trees before their full time of maturity, be kept to the full time, else will not the Cider be worth the drinking.

About twenty, or twenty two bushels of good *Cider-Apples* from the Tree, will make a *Hogshead* of Cider; after they have lain a while in heaps to mellow, about twenty five bushels will make a *Hogshead*.

Then either grinde them in a Horse-mill, like as Tanners grinde their Bark, or beat them with Beaters in a Trough of Wood, rather than of Stone; the more they are ground or beaten, the better.

After the grinding it should be prest, either being Artificially made up with Straw, in form of a Cheese, as the experienced Country-man may direct you; or in a Hair-bag (the more ordinary way for small quantities) and so committed to the *Press*; of which there are several sorts, but the *Screw-press* is to be preferred.

After it's prest, strain it, and put it into the Vessel, and place it wherein it may stand to *ferment*, allowing but a small *Vent-hole*, lest the spirits waste: Fill not the Vessel quite till it hath done working; then fill the Vessel of the same kept for that purpose, and stop it well, only with caution at the first, lest it break the Vessel.

The

The beſt Veſſels for the Tunning up of Cider, and to preſerve it, are thoſe whereof the Barrel-boards are ſtreight, the Veſſel broader at the one end than the other, and ſtanding on the leſſer end, the Bung-hole on the top; the conveniency is, that in the drawing the Cider, though but ſlowly, the Skin or Cream contracted by its Fermentation deſcends, and wholly covers the Liquor by the tapering of the Veſſel, and thereby preſerves the Spirits of the Cider to the laſt, which otherwiſe would waſte and expend themſelves.

If you intend a mixture of water with your Cider, let it be done in the grinding, and it will better incorporate with the Cider in the grinding and preſſing, than afterwards.

Some Cider will bear a mixture with water, without injury to its preſervation, others will not; therefore be not over-haſty with too much at once, till you underſtand the nature of your Fruit.

Some adviſe, that before it be preſt, the *Liquor* and *Muſt* ſhould for four and twenty hours ferment together in a Vat for that purpoſe cloſe covered, which is ſaid to enrich the Liquor.

Other Cider-Fruits. The other ſorts of Fruits for the making of Cider, are the Pippin, Pearmain, Gilliflower, *&c.* by many preferred; with whom we may rank all ſorts of Summer-Apples, as the *Kentiſh Codling*, *Marigolds*, all other ſorts of *Pippins* and *Pearmains*, &c.

Which after they are through ripe, and laid on heaps to ſweat (as before is directed) and grownd or beaten, and preſt as the other, then is not this *Cider* or *Muſt* to be tunned up immediately, but ſuffered to ſtand in the *Vat* four and twenty hours, or more; according as the *Apples* were more or leſs pulpy, and cloſe covered with Hair-cloaths or Sacks, that too much of the Spirits may not evaporate, nor be kept ſo cloſely in as to cauſe Fermentation; in which time the more groſs part of the Feces will precipitate or fall to the bottom, which otherwiſe would have prejudiced the *Cider* by an over-fermentation, and have made it flat and ſowre.

Then at a Tap, three or four inches from the bottom of the Vat, draw forth the Cider, and Tun it up, wherein is yet a ſufficient quantity of that groſs *Lee* or Feces to cauſe Fermentation; the want of the right underſtanding whereof, is one of the main cauſes of ſo much bad Cider throughout *England*.

2. *Of the making of Perry.*

Sorts of Pears. *Non omnis fert omnia tellus.* In ſome places *Pears* will thrive where *Apples* will not; the Trees are larger, and bear greater quantities than Apple-trees. In *Worceſterſhire* they have great plenty of *Pears* for *Perry*; and alſo in the adjacent Countries: The beſt for *Perry* are ſuch that are not fit to be eaten; ſo harſh, that Swine will not eat, nay hardly ſmell to them; the fitter to be planted in Hedg-rows, *&c.* The *Boſbury-Pear*, the *Horſe-Pear*, the *Bareland-Pear*, and the *Choak-Pear*, are ſuch that bear the

the name of the beſt Pears for Perry; the redder they are, the more to be preferred.

Pears are to be fully mature e're they be grownd, and let lye on heaps as the Apples. *Making of Perry.*

Crabs and *Pears* grownd together, make an excellent Liquor; the *Crabs* helping to preſerve the *Perry*.

The method of making *Perry* differeth not from that of *Cider*.

3. *Some Obſervations concerning Cider.*

Thick *Cider* may by a ſecond Fermentation be made good and clear; but Acid Cider is rarely recovered.

Wheat unground, about a Gallon to a Hogſhead, or *Leven* or *Muſtard* ground with *Cider*, or much better with *Sack*, a pint to a Hogſhead, is uſed either to preſerve or recover *Cider* that's in danger of ſpoiling.

Ginger accelerateth the Maturation of the Cider; giveth it a more briſky Spirit, helpeth Fermentation, and promoteth its duration.

New Veſſels affect the Cider with an ill ſavour, and deep colour; therefore if you cannot obtain Wine-Cask, which are the beſt, nor yet can ſeaſon your own with Beer, or other Drinks, then ſcald it with water, wherein a good quantity of *Apple-Pounce* hath been boiled.

If the Veſſel be tainted, then boil an ounce of Pepper in water, enough to fill the Veſſel; and let it ſtand therein two or three days.

Or take ſome quick Lime and put in the Veſſel, which ſlacken with water: cloſe ſtop it, and tumble it up and down; till the Commotion ceaſe.

Two or three Eggs put into a Hogſhead of *Cider* that is ſharp, ſometimes lenifies it: Two or three rotten *Apples* will clarifie thick Cider.

The mildneſs and temperature of the weather is of much concernment in the Fermentation of Cider.

Boil Cider immediately after the Preſs, before Fermentation.

Wheaten-Bran caſt in after Fermentation, thickens the *Coat* or *Cream*, and much conduceth to its preſervation.

The Cider that runs from the *ground*, or *beaten Apples*, before they are in the Preſs, is much to be preferred.

Let the Veſſel not be quite full, that there may be room for the Cider to gather a head or Cream.

Pearmains make but ſmall Cider of themſelves.

Botling is the only way to preſerve Cider long: It may be botled two or three days after it is well ſetled, and before it hath throughly *fermented*; or you may bottle it in *March* following, which is the beſt time. *Botling of Cider.*

Bottles may be kept all the Summer in cold Fountains, or in Cellars in Sand: If they are well Corked and bound, they may be kept many years in cold places; the longer the better, if the Cider be good.

After Cider hath been botled a week, (if New Cider, elſe at the time of botling) you may put into each bottle a piece of white Sugar as big as a Nutmeg; this will make it brisk.

If your bottles be in danger of the Froſt, cover them with ſtraw: about *April* ſet them in Sand, or in a Fountain.

It is not the beſt way to grinde or beat Apples in Stone-troughs, becauſe it bruiſes the kernels and tails of the Fruit too much, which gives an ill ſavour to the Cider; but beaten or ground in wooden-troughs, frees it from that quality.

After your Apples are beaten or ground, it's the beſt way to let them ſtand a day or two before you preſs them; for the Cider doth a little ferment and maturate in the Pulp, and obtains a better colour, than if immediately preſſed.

After they are preſſed, it's good to let the Cider ſtand in a Vat covered, to ferment a day and night, before you Tun it up; and then draw it from the Vat by a Tap, about two inches from the bottom, or more, according to diſcretion, leaving the Feces behinde; which will not be loſt, if you put it up on the Chaff; for then it meliorates your Pur, or Water-Cider, if you make any.

When your Cider is Tunn'd into the Barrel where you intend to keep it, leave ſome ſmall vent open for ſeveral days, until its wilde ſpirit be ſpent; which will otherwiſe break the Barrel, or finde ſome vent that will always abide open (though but ſmall) to the ruine of your Cider. Many have ſpoiled their Cider by this only neglect, and never apprehended the cauſe thereof; which when ſtopt cloſe, after this wilde ſpirit is ſpent (although ſeemingly flattiſh at firſt) will improve, and become brisk and pleaſant Cider in a little time.

If Cider prove thick or ſowriſh, bruiſe a few Apples, and put in at the Bung of your Barrel, and it will beget a new Fermentation, and very much mend your Cider, ſo that in a few days after you draw it off into another Veſſel.

If Cider be only a little ſowriſh, or drawn off in another Veſſel, the way to correct or preſerve it, is to put about a Gallon of Wheat (blaunch'd is beſt) to a Hogſhead of Cider; and ſo, according to that proportion, to a greater or leſſer quantity, which will as well amend as preſerve it.

If Cider hath any ill ſavour or taſte from the Veſſel, or any other cauſe, a little Muſtard-ſeed ground with ſome of the Cider, and put to it, will help it.

Mixture of Fruit is of great advantage to your Cider: the meaneſt Apples mixt make as good Cider, as the beſt alone; always obſerving, that they be of equal ripeneſs, except the Red-ſtreak, and ſome few celebrated Cider-Apples.

4. *Of the Wines or Juices of other Fruits.*

If *Cherries* were in ſo great plenty that the Markets would not take them off at a good rate, they would become very beneficial

cial to be converted into Wine, which they would yield in great quantity, very pleaſant and refreſhing; and a finer, cooler, and more natural Summer-drink than Wine. It may alſo be made to keep long: Some hath been kept a whole year, and very good.

Although it may not prove ſo brisk, clear, and curious a drink as *Cherry-wine*, yet where *Plums* are in great plenty, (they being Trees eaſily propagated) a very good Wine may be made of them; according to the great diverſity of this ſort of Fruit, you muſt expect divers Liquors to proceed from them. The black tawny Plum is eſteemed the beſt. *Wine of Plums.*

This Fruit yields a good Wine, being prepared by a skilful hand; the natural Juice ſerves, and is of excellent uſe to add a tincture to other paler Wines or Liquors. *Mulberry-Wine*

England yields not a Fruit whereof can be made a more pleaſant drink, or rather Wine, than of this humble Fruit; if compounded with other Wines or drinks, it animates them with ſo high a fragrant ſavour and guſt, that it tempts the moſt curious Palats. *Rasberry-wine.*

The juice of this Fruit, boiled with a proportionable addition of water and Sugar, makes a very pleaſant Wine to the eye and taſte, it being duly fermented and botled. A great quantity of this Fruit may alſo be raiſed in a little ground, and in a few years. *Wine of Currans.*

Of the Juice of Gooſberries extracted in it's due time, and mixed with water and Sugar, is prepared a very pleaſant cooling Repaſt. This Fruit is eaſily propagated, and yields much Liquor: It's uſually made unboiled, becauſe it contracts a brown colour in the boiling. *Gooſeberry-Wine.*

As for any other Liquors, Preſervations, or Conſervations of theſe or any other Fruits, I leave you to the many Tracts publiſhed already on that Subject.

CHAP. VIII.

Of ſuch Tillage, Herbs, Roots and Fruits, that are uſually planted and propagated in Gardens and Garden-grounds, either for neceſſary Food, Uſe, or Advantage.

The advantage of Garden-Tillage in general.

MOſt of theſe ſeveral ſorts of *Tillage*, whereof we are now to treat in this Chapter, will raiſe unto the Induſtrious Husbandman an extraordinary advantage, and are not to be eſteemed amongſt the leaſt of Improvements; for each ſort being properly planted in ſuch ground they moſt naturally delight in, and being well Husbandried, and judiciouſly ordered, produce an incredible advantage.

But think not this ſtrange, that common and well-known Plants, that are ſo natural to our Engliſh Soyl, ſhould prove ſo beneficial; it is for no other cauſe, than that ſome men are more Induſtrious and Ingenious than others: For theſe Garden-plants proſper not without great labour, care and skill; and beſides, are ſubject more than others to the injuries of unſeaſonable weather. Neither of which the ſlothful or ignorant Husbandman can away with; affecting only ſuch things that will grow with leaſt toyl, hazard, or expence, though they feed on bread and water, when the diligent and induſtrious Adventurer lives like a petty Prince on the fruit of his labours and expectation, which ſufficiently repays his expence and hazard. It is hard to finde any Trade, Occupation, or Imployment, that a man may preſume on a large and Noble Requital of his time, coſt or induſtry, but it is hazardous, eſpecially to ſuch that attempt the ſame without a ſpecial affectation thereunto, or skill therein.

Nil tam difficile eſt quod non Solertia vincet.

So this Art and Imployment of Planting, Propagating and Encreaſing of *Hops*, *Saffron*, *Liquorice*, *Cabbage*, *Onions*, and other Garden-Commodities, being caſual, and more ſubject to the injuries of the weather than commonly Corn or Graſs is, makes it ſo much neglected; for one bad Crop, or bad year for any of them, ſhall more diſcourage a Countryman from a Plantation thereof, than five good Crops, though never ſo profitable and advantagious ſhall incourage: Ignorant and ſelf-willed men are naturally ſo prone to raiſe Objections, on purpoſe to deter themſelves and others from any thing whatſoever that's either pleaſant or profitable.

But we hope better of the Ingenious, that they will ſet to their

their helping hand to promote this uſeful and neceſſary *Art*, and thereby become a provoking Preſident to their ignorant Neighbours, that our Land may be a Land of Plenty, that it may ſuperabound with neceſſaries, and rather afford a ſupply to their Neighbours, than expect it from them, as we are inforced to do in ſeveral ſorts of thoſe things we treat of in this Book: Thoſe of our own growth alſo far exceeding that we have abroad; which inconveniencies and diſadvantages nothing can better prevent, than our own Induſtry and Ingenuity.

Beſides, moſt of this Garden-Tillage is of late years become a more general Food than formerly it was: Scarce a Table well furniſht, without ſome diſhes of choice Roots or Herbs; and it is not only pleaſant to the rich, but good for the poor labouring man; many, where plenty is, feeding for the moſt part on Tillage, which hath occaſioned that great encreaſe of Gardens and Plantations in moſt of the Southern parts of *England*. Several ſorts alſo of Tillage being profitable in the feeding of Cattle and Fowl.

SECT. I.

Of Hops.

We mention this Plant in the firſt place, not for his worth or Dignity above the reſt, it being eſteemed an unwholeſome Herb or Flower for the uſe it is uſually put unto, which may alſo be ſupplied with ſeveral other wholeſomer and better Herbs; but for that of all other Plants, it advanceth Land to the higheſt improvement, uſually to forty pound, or fifty pound; ſometimes to an hundred pound *per* Acre.

And yet have we not enough planted to ſerve the Kingdom, but yearly make uſe of *Flemiſh Hops*, nothing near ſo good as our own. The principal cauſe I preſume is, that few beſtow that labour and induſtry about them they require, and ſufficiently retaliate: for being managed careleſly, they ſcarce yield a quarter part of the increaſe that thoſe yield that are dexterouſly handled, though with very little more coſt. Another cauſe is why they are no more propagated here, that they are the moſt of any Plant that grows ſubjected to the various Mutations of the Air, from the time of their firſt ſpringing, till they are ready to be gathered. Over-much drought, or wet, ſpoils them: Mill-dews alſo ſometimes totally deſtroys them; which caſualties happening unto them, makes their price and valuation ſo uncertain, and proves ſo great a diſcouragement to the Countryman; elſe why may not we have as great a plenty of them, as in *Flanders*, *Holland*, &c. Our Land is as cheap, and affords as great a Crop (if as well Husbandried) and we pay not for carriage ſo far, but that they are more Induſtrious than us: Therefore ſeeing that is ſo gainful a Commodity to the Husbandman, and that there is a ſufficient vent for them at home, we ſhall be the more Prolix in the ſubſequent diſcourſe.

The

Best Land and ſcituation for a Hop-garden.

The Hop delights in the richeſt Land; a deep Mould, and light; if mixed with Sand it's the better: a black Garden-mould is excellent for the Hop.

If it lye near the water, and may be laid dry, it is by much the better.

Moſt ſorts of Land will ſerve, unleſs ſtony, rocky, or ſtiff Clay-ground, which are not to be commended for the Hop.

If you can obtain it, a piece of Land a little inclining to the South, and that lies low, the ground mellow and deep, and where water may be at command in the Summer time, is to be preferred for a *Hop-garden.*

Alſo it ought to lye warm and free from impetuous winds, eſpecially from the *North* and *Eaſt*, either defended by *Hills* or *Trees*, but by *Hills* the beſt.

Defending the Hop-garden by Trees.

Every one cannot have what Land he pleaſeth, but muſt make uſe of what he hath; therefore if your ground lye obvious to the winds, it is good to raiſe a natural defence therefrom, by planting on the edges of the Hop-garden a border or row of Trees that may grow tall, and break the force of the winds at ſuch time the Poles are laden with Hops. The *Elm* is eſteemed not fit to be planted near the Hop, becauſe it contracteth *Milldews*, ſay our Country Hop-planters; the *Aſh* on a dry ground, and the *Poplar* or *Aſpen* on a moiſt, are to be preferred for their ſpeedy growth. Alſo a tall and thick hedge of *White-thorn* keeps the ground warm, and ſecures it in the *Spring* from the ſharp nipping winds that ſpoil the young Shoots.

Aſpen.

Preparing the ground and diſtance of the Hills.

If your Land be cold, ſtiff, ſowre or barren, you deſigne for a Hop-garden, the beſt way is about the latter end of the Summer to burn it, (as before we directed) which will be very available to the amendment of the Land. Some alſo preſcribe to ſow *Turnips*, *Hemp*, or *Beans* therein, to make the ground light and mellow, and deſtroy the Weeds.

But in whatſoever ſtate or condition your ground be, Till it in the beginning of the Winter, with either Plough or Spade.

And when you have ſet out the bounds of your ground you intend to plant, and laid the ſame even, then muſt you mark out the ſeveral places where each Hill is to be: The beſt way is by a Line ſtreightned over-thwart the ground, with knots or threds tyed at ſuch diſtance you intend your Hills. Some plant them in ſquares, *Checquer-wiſe*; which is the beſt way, if you intend to plough with Horſes between the Hills: Others plant them in form of a *Quincunx*, which is the more beautiful to the eye, and better for the Hop, and will do very well where your ground is but ſmall, that you may overcome it with either the *Breaſt-plough* or *Spade*: which way ſoe're it be, pitch a ſmall ſtick at every place where there is to be a *Hill*; and when it is all ſo done, in caſe your ground be poor or ſtiff, bring into it of the beſt Mould you can get, or a parcel of Dung and Earth mixed; and at every ſtick dig a hole of about a foot ſquare, and fill it with this Mould or Compoſt wherein your Plants are to be ſet, they will

thrive

thrive the better, and the ſooner come to bear, and ſufficiently repay your charge and trouble.

Great Rarity there is both in the judgment and the practiſe of moſt men about the diſtance of the Hills, by reaſon of the different Seaſons: Sometimes it falls out to be a moiſt year, and then the Hop grows large; and the wider the Hills are, the better they prove. Some years alſo prove hot and dry, the Hops then grow thin; and the nearer they are, the more Hops they have: But let me adviſe to keep a convenient diſtance, that you may have room ſufficient to come between, and ground ſufficient to raiſe the Hills with the Parings or Surface of it; and that the Sun may come between; and that the Poles may not be driven the one againſt the other with the winds, when they are laden. *Diſtance of the Hills.*

If your ground be dry and burning, about ſix foot may be a convenient diſtance; but if it be a moiſt, deep, and rich Mould, ſubject to bear large Hops, then eight or nine foot diſtance is moſt convenient: and ſo, according to the goodneſs of the ground, place the diſtance of the Hills.

But if your Hills are too far aſunder, the beſt way to remedy that inconvenience, is by encreaſing the number of Hops in the Root in each Hill; by which means you may apply more Poles, and ſupply the former defect. Hills may be made of that bigneſs, that they may require ſix, ten, or twenty Poles. The common Objection is, they cannot ſo conveniently be dreſſed; but I only propoſe it as amendment, to make them ſomewhat bigger than ordinary: Or if your Hills be too near together, you may alſo abate the Hops, and apply the fewer Poles; for over-poling of a ground, as well in number as height, injures it more than under-poling. *Bigneſs of the Hills.*

Authors, and moſt *Practiſers*, uſually adviſe to plant Hops in the end of *March*, or in *April*; but ſome of our beſt experienced Planters affirm it to be beſt in *October*, before the cold Winter; and that then the Hops will ſettle againſt the Spring. *Time of planting Hops.*

Chuſe the largeſt Sets that you can get; which are to be had beſt out of a Garden well kept, and where the Hills have been raiſed very high the precedent year, which increaſeth the Plants both in number and bigneſs: Let them be as long as you can get them; about eight or ten inches may be of a very good length, and in each plant three or four Joynts or Buds. *Choice of Sets, and manner of Setting.*

Before you have your Sets out of the ground, make the holes ready to put them in, if you can, elſe you muſt be forced to lay them in cold and moiſt Earth, and take them out as you have occaſion to uſe them: dig your holes according to the depth of your Plant, eight, ten, or twelve inches deep, and about a foot over.

Some take two or three of the Plants, and joyn the tops together, and ſet them bolt-upright, directly in the middle of the hole, holding them hard together with the one hand, while you fill the hole with the other, with fine Mould prepared and made ready before-hand for that purpoſe; obſerving, that you ſet the

tops

tops even with the Surface of the ground, and the ſame end uppermoſt that grew ſo before; then faſten well the Earth about the Roots.

Others place at each corner of the hole a Plant; which way is to be preferred before the other.

It is convenient to raiſe the Earth two or three inches above the Set, unleſs you plant ſo late, that the Green Sprigs are ſhot forth; then you are not to cover them wholly, leſt you deſtroy them.

Beware of wilde Hops, which are only diſcerned by the Stalk and Fruit.

Dreſſing Hops. If your Hops be old and ill husbandried, or worn out of heart, then about the beginning of Winter dig them, and take away as much of the old barren Earth as you can, and apply good fat Mould or Compoſt to their Roots; or if you cannot conveniently, or think it not fit to do it before Mid-winter, yet neglect not to do it in *January* or *February* at the furtheſt, the weather being open; for ſuch Winter-dreſſing, and renewing their Mould, is a principal Renovation to a decaying Hop: or if your Hop-ground be full of *Weeds* or *Couch-graſs*, ſuch Winter digging of it deſtroys them.

But if your Hops be in good heart, and ſtrong, then late dreſſing is moſt proper, which reſtrains them from too early ſpringing, which is the cauſe of many injuries to the Hop: The only time for ſuch ſtrong Hops to be dreſſed in is *March*; ſome dreſs in the beginning of *April*.

In the dreſſing of Hops, theſe Rules are neceſſary to be obſerved: Firſt, to pull down your hills, and undermine them round about, till you come near to the principal Roots; and then take the upper or younger Roots in your hand, and ſhake off the Earth: which Earth being removed away, with your ſaid Tool you ſhall diſcern where the new Roots grow out of the old Sets; in the doing whereof, be careful that you ſpoil not the old Sets: As for the other Roots that are to be cut away, you ſhall not need to ſpare them to the delay of your work, except ſuch as you mean to ſet.

Take heed that you uncover not any more than the tops of the old Sets in the firſt year of cutting: at what time ſoever you pull down your hills, cut not your Roots before *March*.

At the firſt dreſſing of young Hops, cut away all ſuch Roots or Sprigs as grew the year before out of your Sets, within one inch of the ſame: Every year after you muſt cut them as cloſe as you can to the old Roots, even as you ſee an *Oſiers* head cut, ſay our Authors; but it is found experimentally to be advantagious to a weak Hop, to leave ſome principal new ſhoots at the dreſſing; and that the clean cutting off of them, hath very much decayed a Hop-garden.

The Roots that grow downward are not to be cut, but ſuch that grow outward at the ſides of the Plants may, elſe they will incumber the ground.

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The old Roots are red, theſe of the laſt year white; if there be any wilde Hops, you muſt take up the whole hill, and new plant it, marking the hill with a ſtick at the Hop-harveſt, to prevent miſtakes.

When you have dreſſed the Roots, then apply of your rich Mould or Compoſt prepared for that purpoſe, and make the hill not too high at firſt, leſt you hinder the young Shoots; although the Hops be ſprung out of the hills, yet fear not the cutting of them off when you dreſs them.

Be ſure to keep Poultry, and eſpecially Geeſe, out of the Hop-garden, eſpecially during the Spring.

Of Poling the Hops.

According to the diſtance of your hills, and nature of the ground, provide the number of your Poles; and according to the ſtrength of the Hop, the length or bigneſs.

If the hills be wide, the more Poles, ſometimes four or five to a hill; if the hills are near, then two or three may ſuffice: In hot, and dry, and hungry ground, the Poles may ſtand nearer than in rich mellow Land, where they are more ſubject to grow groſs and hawmy.

Alſo if your Hops be ſtrong, and ground rich, provide large Poles, either in bigneſs or in length, or elſe you looſe the beſt of your profit for want of Poles; but if they are poor, provide but ſmall Poles, leſt you impoveriſh the Root, for the Hop will ſoon run it ſelf out of heart, if over-poled: More eſpecially, be ſure not to over-pole Hops the firſt Year of their Plantation, although they require as many Poles (or rather Rods) the firſt, as any other Year.

You muſt be content with ſuch Poles the Country you live in affords; *Alder*-poles are eſteemed the beſt, becauſe the Hop moſt willingly climbeth them, by reaſon of their ſtreight and tapering form, and alſo their rough rinde, which ſuffers not the Hop ſo eaſily to ſlip down.

But the *Aſh* is eſteemed the beſt for laſting, eſpecially ſuch that grow on dry and barren Lands of many years growth, which are known by the many Circles in the bottom: I have known ſuch to have laſted ten or twelve Years, the Wood being much harder, and more durable, than the ſpeedy grown Poles.

Some altogether reject forked Poles, and uſually cut off the forked branches, if any, becauſe they cannot (as they pretend) ſo eaſily ſtrip off the Hops at gathering time: But I have known the greateſt burthen of Hops on a forked Pole, and to have ſuffered leſs injury by the Winds when they have been fully blown; and that inconveniency of not ſtripping them, is eaſily remedied by our directions, as you will hereafter finde.

Diſperſe the Poles among the hills before you begin to Pole, laying of them between the hills.

Begin not to Pole until your Hops appear above the ground, that you diſcern where the biggeſt Poles are required, and ſo may you continue Poling till they are a Yard in height, or more; but ſtay not too long, leſt you hinder the growth of the Hop,

which will grow large, unleſs it hath a Pole, or ſuch like, to climb unto.

Set the Pole near to the hill, and in depth according to the height of the Pole, nature of the ground, and obviouſneſs to winds, that the Pole may rather break than riſe out of the ground by any fierce winds.

Let the Poles lean outward the one from the other, that they may ſeem to ſtand equi-diſtant at the top, to prevent Houſling, as they term it, which they are ſubject unto if they grow too near the one from the other; that is, they will grow one amongſt another, and cauſe ſo great a ſhade, that you will have more Hawm than Hops. Alſo it is eſteemed an excellent piece of Husbandry to ſet all the Poles inclining towards the South, that the Sun may the better compaſs them. This is moſt evident, that a leaning or bending Pole bears more Hops than an upright.

Be ſure to reſerve a parcel of the worſt Poles, that you may have for your need, in caſe when the Poles are laden, a Pole may break, or be over-burthened, to ſupport it; for if they lie on the ground, they ſoon periſh.

With a Rammer you may ram the Earth at the out-ſide of the Pole, for its further ſecurity againſt winds.

If after ſome time of growing you finde a Hop under or over-poled, you may unwinde the Hop, and place another Pole in its place, having a Companion with you to hold the Hop, whileſt you pitch in the Pole; or elſe you may place another Pole near it, and bring the Hop from one Pole to the other.

Of tying of Hops to the Poles.

The next work is after the Hops are gotten two or three foot out of the ground, to conduct them to ſuch Poles as you think fit, that are either neareſt, or have feweſt Hops, and winde them or place them to the Pole, that they may winde with the courſe of the Sun, and binde them gently thereto with ſome withered Ruſh, or woollen Yarn; two or three ſtrings are enough to a Pole. I have known more Hops on a Pole from one ſtring, than from four or five, though there hath been more of Hawm.

Be cautious of breaking the tender Shoots, which in the morning is moſt dangerous; but when the warmth of the day hath toughned them, may it much better be done.

You muſt be daily amongſt the Hops, during *April* and *May*, eſpecially guiding and directing them, elſe will they be apt to break their own Necks by going amiſs: It will ſufficiently requite your labour and care at Harveſt.

It is convenient with a forked Wand to direct the Hops to the Poles that are otherwiſe out of reach, or to have a ſtool to ſtand on, or a ſmall Ladder made with a ſtay on the back of it, that you may reach them with your hands.

About *Midſummer*, or a little after the Hop begins to leave running at length, and then begins to branch, that ſuch Hops that are not yet at the tops of the Poles, 'twere not amiſs to nip off the top, or divert it from the Pole, that it may branch the better; which is much more for the encreaſe of the Hop, than to extend it ſelf only in length.

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Sometimes in *May*, after a Rain, pare off the Surface of the ground with a Spade, How it off with a How, or run it over with a Plough with one horſe, if you have room enough, or with a Breaſt-plough; and with theſe parings raiſe your hills in height and breadth, burying and ſuppreſſing all ſuperfluous Shoots of Hops and weeds. *Of the making of the Hills.*

By this means you will deſtroy the weeds that otherwiſe would beggar your Land, and you ſuppreſs ſuch Suckers and weeds that would impoveriſh your Hops; and you alſo preſerve the hills moiſt by covering them, that the drought of the Summer injureth them not: Alſo the Hop, ſo far as it is covered with Earth, iſſues forth its roots to the very ſurface of the Earth, which proves a very great ſuccour to the Hop. This work may be continued throughout the Summer, but more eſpecially after a Rain, to apply the moiſt Earth about the roots of the Hop.

Therefore it behoveth you to keep the ground in good heart, for this purpoſe, that your Hops may be the better; and in caſe it ſhould prove a very dry Spring, it would not be amiſs to water the Hops before you raiſe your hills.

A dry Spring, ſuch that happened in the Years 1672. and 1674. proves a great check to the hop in its firſt ſpringing, eſpecially in hot and dry grounds. In ſuch Years it is very advantagious to water them, if it can with conveniency be obtained, either from ſome Rivulet or Stream running through, or near your Hop-garden, or from ſome Well digged there, or out of ſome Pond made with Clay in the lower part of your ground, to receive haſty ſhowres by ſmall Aqueducts leading unto it, which is the beſt water of all for this purpoſe. *Manner of watering Hops.*

In the midſt of every hill make a hollow place, and thruſt ſome pointed Stick or Iron down in the middle thereof, and pour in your water by degrees, till you think the hill is well ſoaked; then cover the hill with the parings of your Garden, as before we directed, which will ſet the Hop mainly forward, as I have known, which otherwiſe would be ſmall and weak, and hardly ever recover to attain its uſual height. Alſo a very hot and dry Summer, will make the Hop blow but ſmall and thin; therefore would it not be labour loſt to beſtow a pail of water on every hill, prepared before-hand to receive it.

For in ſuch dry Springs or Summers, ſuch Hops that either ſtand moiſt, or have been watred, do very much out-ſtrip their Neighbours, and in ſuch years they will far better requite your labour and induſtry, yielding a greater price, by reaſon of their ſcarcity, than in other ſeaſonable years, when every ground almoſt produceth Hops; Induſtry and Ingenuity, in theſe Affairs, being moſt incouraged, and beſt rewarded, at ſuch times when Ignorance and Sloth come off with loſs and ſhame.

After every watering (which need not be above twice or thrice in the drieſt Summers, ſo that they be throughly wet) be ſure to make up the hills with the parings, and with the weeds, and cooleſt and moiſteſt materials you can get; for the more the Hop

is ſhaded at the root from the Sun, the better it thrives, as is evident by ſuch that grow under ſhelter that are never dreſt, yet may compare with thoſe you beſtow moſt pains and skill on.

The dreſſing of your Hops, and poling them, the directing and binding them to the Poles, the watering and making up the hills throughout the Summer, ſeems to be a tedious task, requiring daily attendance: But without theſe Labours little is to be gotten, which makes this Plantation ſo little made uſe of in ſome places; yet he that is diligent, and underſtands his buſineſs, is ſo highly requited for his care, coſt and induſtry, that an Acre or two of ground ſo managed by one or two perſons, ſhall redound one year with another to more advantage, than fifty Acres of Arable-Land, where there is much more time, coſt and expence beſtowed on it.

When Hops blow, bell, and ripen.

Towards the end of *July* hops *blow*, and about the beginning of *Auguſt* they *bell*, and are ſometimes ripe, in forward years, at the end of *Auguſt*, but commonly at the beginning of *September*.

When to gather Hops, and the Manner how.

At ſuch time as the hop begins to change his colour, and look a little browniſh, or that they are eaſily pulled to pieces, or that the Seeds begin to change their colour towards a brown, and they ſmell fragrantly, you may conclude them to be ripe, and procure what help is neceſſary for a quick diſpatch, to gather them before they ſhatter, one windy day or night may otherwiſe do you much injury.

The manner uſually preſcribed for the gathering of hops, is to take down four hills ſtanding together in the midſt of your Garden; cut the roots even with the ground, lay it level, and throw water on it, tread it, and ſweep it; ſo ſhall it be a fair Floor, whereon the hops muſt lie to be picked.

On the out-ſide of this Floor are the Pickers to ſit and pick them into Baskets, the hops being ſtript off the Poles, and brought into the Floor.

Some there are that ſit diſperſedly, and pick them into Baskets, after they are ſtript off the Poles.

Remember always to clear your Floor twice or thrice every day, and ſweep it clean every ſuch time, before you go to work again.

In theſe ways of picking, it is neceſſary that the Poles be ſtreight, without forks, ſcrags or knobs.

But the beſt and moſt expeditious way, is to make a Frame with four ſhort Poles or Sticks, laid on four Forks driven into the ground, of that breadth to contain either the hair of your Ooſt or Kiln, or a Blanket tacked round the ſame about the edges; on which Frame you may lay your Poles with the hops on them, either ſupported with Forks, or with the edges of the Frame; the Pickers may ſtand on each ſide, and pick into it. When the Blanket or hair is full, untack it, carry it away, and place another, or the ſame emptied, in the ſame Frame again: every day you may remove your Frame with little trouble to ſome new place of your Garden near your work.

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This way is found to be moſt convenient, expeditious, and advantagious; for it ſaves the labour of ſtripping the Hops off the Poles. Alſo any forked or ſcraggy Poles which are beſt for the Hop, prove no impediment to this way of Picking: It preſerves the hops from briting or ſhedding, which by ſtripping off the Poles, and wrapping them up in bundles to carry up and down, they are apt to do. Alſo this way they may pick them clean off the Poles as they hang, without tumbling and tearing, which cauſes much filth to mix with the Hops, beſides the ſpoiling and loſs of many Hops: and being thus picked over your Frame, if the Hops be never ſo ripe, and ſubject to ſhatter, all is preſerved. The Pickers may this way alſo make more expedition than the other, the Hops hanging in view as they grew on the Poles.

Before you draw your Poles, with a ſharp hook fixed at the end of a long ſtale or pole, divide the Hops above where they grow together with other Poles; then ought you to cut the Hops, not as is uſually preſcribed and practiſed cloſe at the hills, but about two or three foot above the hills, elſe will the Hop bleed much of his ſtrength away. This hath been found to be a great ſtrengthner of weak Hops, the other a weakner to all.

Then draw your Poles, which in caſe they are ſo far or faſt in the ground, that you cannot raiſe them without breaking of them, you muſt get a pair of Tongs made like unto a Blackſmiths Tongs, only ſtronger, and toothed at the end, with which Tongs you may beclip the Pole at the bottom, and reſting the joynt thereof on a block of wood, you may weigh up the Pole without trouble or danger of breaking the Pole: or for cheapneſs ſake, you may have a wooden Leaver forked at the end, in which Fork fix two ſides of ſharp and toothed iron; which put to the Pole, and on a block of wood, as before, you may heave up the Pole by the ſtrength of your right hand, whileſt you pull the pole to you with your left.

Cut no more ſtalks, nor draw no more than you can conveniently diſpatch in an hour or two, in caſe the weather be very hot, or it be likely to rain.

If your Hop-garden be large, it were worth your coſt and pains to raiſe in the midſt thereof a Shed, or ſuchlike houſe, on four or ſix main forks or poſts, and Thatched over, under which ſhelter you may pick your Hops; which will both defend your pickers from the Sun, and your Hops from the Sun and ſtorms. Herein alſo may you lay a parcel of Hops unpicked over-night, that your pickers may to work in the next morning, before the Dew be off the other that are abroad: or in caſe a ſtorm comes, you may lay in here enough to ſerve till the other are dry again. Under this ſhelter alſo may your Poles lie dry all the Winter.

Let not your hops be wet when you gather them; but if the Dew be on them, or a Showre hath taken them, ſhake the Pole, and they will be dry the ſooner.

If your hops be over-ripe, they will be apt to ſhed their ſeed, wherein conſiſteth the chiefeſt ſtrength of the hop: Alſo they will

will not look ſo green, but ſomewhat brown, which much diminiſheth the value of them; yet ſome let them ſtand as long as they can, becauſe they waſte leſs in the drying: four pounds of undried Hops, through ripe, will make one of dry; and five pounds of Hops ſcarcely ripe, yet in their prime, makes but one: So they judge they get more in the through-ripe Hop by the weight, than they looſe in the colour.

There are alſo two ſorts of Hops, the green and the brown; the one yielding a better colour by much when they are dry, the other bears larger and a greater quantity of Hops, which is rather to be preferred.

In the picking, keep them as clean as you can from leaves and ſtalks, which will damage you more in the ſale, than they will advantage you in the weight.

Of the drying of Hops.

As faſt as you pick them dry them, for their lying undried heats them, and changes their colour, very much to the damage of the Hop: but if your Kiln be full, and that you muſt keep your Hops a while, then ſpread them on ſome Floor, that they may not lie too thick; and thus will they keep a day or two without much damage.

Well drying of a Hop, is the moſt neceſſary thing to be taken care of; for if that be not rightly done, they are not fit for the Market, nor for uſe; for a handful of ſlack dried Hops will mar and ſpoil many pounds, taking away their pleaſant ſcent and colour: Therefore let your Hops be throughly and evenly dried; which to accompliſh, there are ſeveral ways made uſe of, ſome whereof that are moſt uſeful and neceſſary, I ſhall here diſcover.

Deſcription of an Ooſt or Kiln.

This following Deſcription we finde to be uſed by the *Flemmings*, or *Hollanders*; and alſo at *Poppering*.

Firſt make the ſquare Room or Kiln above eight or ten foot wide, according as you deſire it to be in bigneſs, built up with Brick or Stone, with a Door-place at one ſide thereof.

In the midſt of this Room, on the Floor, muſt the Fire-place be made, about thirteen inches wide within, and about thirty inches high in length from the mouth thereof, almoſt to the back-part of the Kiln or Ooſt, leaving only a way for a man to go round the end of it; it is uſually called a Horſe, and is commonly made in Malt-kilns, the fire paſſing out at holes on each ſide, and at the end thereof; and needs no farther deſcription, every Maſon or Bricklayer almoſt is acquainted with it.

About five foot high is placed the Bed or Floor whereon the Hops lie to be dried, which muſt have a Wall about it four foot high, to keep the Hops up from falling. At the one ſide of the upper Bed muſt be made a Window, to ſhove off the dried Hops down into the Room prepared for them.

The Bed muſt be made of Laths or Rails ſawn very even, an inch ſquare, and laid a quarter of an inch aſunder, with a croſs Beam to ſupport them in the middle; into which Beam the Laths are to be let in even with the top of it, which keeps the Laths even in their places.

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On this Bed, without any Ooſt-cloth, lay your Hops by Baſket-fulls, beginning at the one end, and ſo proceeding till all be cover'd about half a Yard thick, without treading on them; then lay them even with a Rake or Stick, that they may not lie thicker in one place than in another.

Then make your fire below of broken Poles, or other wood, ſay our Authors: But Chareoal is the only fewel for Hops, not in any wiſe diminiſhing the colour, which ſmoaky wood or brands will do.

You muſt keep your fire at a conſtant heat, only at the mouth of the Furnace the Air will diſperſe it ſufficiently.

The Hops this way are not to be ſtirred until they are throughly dried, which is not until the top are dry as well as the bottom; but if any place be not ſo dry as the reſt, (which you may perceive by reaching over them with a Stick or Wand, and touching them in ſeveral places, obſerving where they rattle, and where not) then abate them there, and diſpoſe of them where the places were firſt dry.

When they are all through dry, which is known by the brittleneſs of the inner ſtalk, if rubbed, and it break ſhort, then are they enough; then take out the fire, and ſhove out the Hops at the window for that purpoſe, with a Coal-rake made of a board at the end of a Pole, into the Room made to receive them; then go in at the door below, and ſweep together the Seeds and Hops that fell through, and lay them with the other.

Then proceed to lay another Bed of green Hops, as before, and renew the fire.

Another way to dry Hops.

In ſeveral places they dry their Hops on the ordinary Malt-kilns on a Hair-cloth, laying them about ſix inches thick; and when they are almoſt dry, with a Scoop made for that purpoſe, they turn them up-ſide down, and let them lie again till every hop as near as they can, be throughly dried; and then with the Hair-cloth remove them to the heap where they are to lie till they are picked.

Both theſe ways are ſubject to ſeveral inconveniencies: In the firſt way the hops lying ſo thick, and never turned, the under-part of them muſt needs be dry long before the upper; and the fire paſſing through the whole Bed to dry the uppermoſt hop, muſt needs over-dry, and much injure and waſte the greater part of the Hops, both in ſtrength and in weight, beſides the waſte of firing, which muſt be long continued to through dry ſo many together.

In the ſecond way, the turning of the hops breaks them very much, by forcing the Scoop againſt the rough Hair-cloth, frets and ſpoils many hops, and ſhatters their ſeeds, elſe this way is rather to be preferred above the other.

The beſt way to dry Hops.

Which ſeveral inconveniencies may be removed and prevented, by making the lower part of the Kiln as before is deſcribed, and the Bed thereof made after the following manner: Firſt, make a Bed of flat ledges about an inch thick, and two or three inches

inches broad, ſawn, and laid acroſs on the other, Checquer-wiſe, the flat way, the diſtances between about three or four inches, the ledges ſo entred the one into the other, that the Floor may be even and ſmooth: This Bed may reſt on two or three Joyces ſet edge-wiſe to ſupport it from ſinking.

Then cover this Bed with large double Tin ſoudred together at each joynt; and ſo order the ledges before you lay them, that the joynts of the Tin may always lie over the middle of a ledge; and when the Bed is wholly covered with Tin, fit boards about the edges of the Kiln to keep up the hops, only let the one ſide be to remove, that the hops may be ſhoved off (as before.)

On this Tin-Floor or Bed may the hops be turned without ſuch hazard or loſs, as before on the hair, and with leſs expence of fewel: Alſo any manner of fewel will ſerve for this purpoſe as well as Charcoal, the ſmoak not paſſing through the hops as in either of the other ways: but you muſt remember to make Conveyances for it at the ſeveral corners and ſides of your Kiln or Ooſt.

Only the ſaving of fewel, beſides the advantage your hops receive, will of it ſelf in a little time recompence the charge extraordinary in making the Tin-Floor.

To dry Hops ſuddenly without turning them.

The turning of hops after the moſt facile and ſecure way, is yet found to be not only a waſte and injury of the hop, but alſo an expence of fewel and time, becauſe they require as much fewel, and as long time to dry a ſmall part when they are turned, as if they were almoſt all to be dried; which may be prevented, in caſe the upper-bed whereon the hops lie, have a Cover made that may be let down and raiſed at pleaſure; which Cover may be Tinned over, only by nailing ſingle Tin over the face of it, that when the hops begin to dry, and ready to turn, that is, that the greateſt part of the moiſture be evaporated away, then may you let down this Cover within a foot or leſs of the hops, which (Reverberatory-like) will reflect the heat upon them, that the uppermoſt hop will ſoon be as dry as the lower, and every hop equally dried.

This is the moſt expeditious, moſt ſure, and leaſt expenſive way that can be imagined to dry hops, which is one of the coſtlieſt, troubleſome, and moſt hazardous piece of work that belongs to the hop, as it is vulgarly uſed.

Bagging of Hops.

As ſoon as your hops are off the Kiln, bag them not immediately, but lay them in ſome room or place, that they may lie three or four weeks or more, that they may cool, agive, and toughen; for if they are immediately bagged, they will break to a Powder, but if they lie a while (the longer the better, ſo they be cloſe covered from the Air with Blankets) you may pack or bag them with more ſecurity.

The manner whereof is uſually thus; make a hole round or ſquare in an upper Floor big enough, that a man may with eaſe go up and down, and turn and winde in it; then tack on a hop about

about the mouth of the Bag faſt with Packthread, that it may bear the weight of the Hops when full, and of the Man that treads them; then let the Bag down through the hole, and the Hop will reſt above, and keep the Bag from ſliding wholly through: Into which Bag caſt in a few Hops; and before you go into tread, tye at each lower corner a handful of Hops, with a piece of Packthread, to make as it were a Taſſel, by which you may couveniently lift or remove the Bag when he is full; then go in to the Bag and tread the Hops on every ſide, another caſting ſtill in as faſt as you require them, till it be full: When it is well trodden and filled, let down the Bag by unripping the hoop, and cloſe the mouth of the Bag, filling the two upper corners as you did the two lower.

Which Bag, if well dried and well packed, may be preſerved in a dry place ſeveral Years; but beware leſt the Mice deſtroy and ſpoil them.

Laying up the Poles.

After you have dried and laid by your Hops, you may return again to the Hop-garden, and take care to preſerve the Poles for another Year.

Strip off the Hawm clean from them, and ſet up three Poles (like unto a Triangle, wherewith they uſually weigh heavy ware) ſpreading at the bottom, and bound together near the top, about which you may ſet your Poles as many as you pleaſe; binde them about with a little Hawm twiſted, to keep them together: By this means the outward Poles are only ſubject to the injuries of the weather, which keep all the inner Poles dry, except only the tops, which for the moſt part are expoſed to the Air and wet.

Therefore the moſt part Pile them up at length in Piles in ſeveral places of the Hop-garden, by pitching in ſeveral Poles on each ſide the Pile, and laying two or three old Poles athwart at the bottom to keep them from the moiſt ground, and ſo lay the Poles that the ſmaller ends may be inwards, and the bigger ends outwards; for which purpoſe the Pile muſt be made ſomewhat longer than the Poles; and when you have raiſed them high enough, with Ropes of Hawm binde the Poles that ſtand on the one ſide overthwart to the Poles on the other, to preſerve them upright, and cover them with Hawm, to defend them againſt the Rain.

But the better way is to lay them in ſuch Shed or houſe erected in your Hop-garden, which may ſerve for picking of Hops there in the Summer, and preſervation of the Poles in the Winter; it will ſoon requite your coſt.

Dunging or Soyling of the Hop-garden.

In the Winter, when little elſe can be done to the hop-garden, then may you provide Soyl and Manure againſt the Spring; if the Dung you carry in be rotten, then mix it with two or three parts of the common earth, and ſo let it lie well mixed till the Spring, which will ſerve to make up the hills withal.

But if the Dung or Soyl be new, then let it lie mixed till another Year, for new Dung is very injurious to hops.

Horſe-dung, Cow-dung, or Oxe-dung are very good, but no Dung is to compare with Pigeons-dung, a little thereof only to a hill, and mixed, that it may not be too hot in a place: Sheeps-dung alſo is very good.

In the Spring or Summer-time, if you ſteep Sheeps-dung, Pigeons-dung, or Hen-dung in water, till it be quite diſſolved; and when you water your hops on the top of every hill in the hollow place made to contain the water, you may put a diſhful of this diſſolved dung, and the water wherewith you water your hops will carry with it the vertue thereof to the roots of the hop, which may prove the moſt expeditious, advantagious, and leaſt expenſive way of inriching the hop-hills of any other.

Alſo by this means you may convey to the Roots of hops, or any other Plant, the fixed Salt or vertue of Lime, Aſhes, or any other Fertilizing or inriching Subject whatſoever, whereof we have already diſcourſed.

SECT. II.

Of Liquorice, Saffron, Madder, and Dyers Weed.

Of Liquorice. The Land this Plant principally delights in, being not every where to be had, is one of the cauſes it is ſo much neglected, and the method of Planting and ordering of it ſo little underſtood: although our Engliſh Liquorice exceeds any Forreign whatſoever, yet have not we enough Planted, but Yearly buy of other Nations.

Beſt Land for Liquorice, and the ordering of it. It much delights in a dry and warm Land, light and mellow, and very deep: for in the length of the Root conſiſts the greateſt advantage; for if it be not light, dry and deep, the Roots cannot inlarge freely; ſuch Land that Carriots, Parſnips, *&c.* delight in, Liquorice will proſper in it: If the ground be not very rich of it ſelf, you muſt mix good ſtore of the beſt and lighteſt Soil in the digging; it muſt be trenched very deep, at the leaſt three Spades deep, in caſe the Mould will bear it, and lay it as light as poſſibly you can. The beſt way is to dig it with the Dung at the beginning of the Winter, and then dig it again at Planting-time, which will lay it much the lighter, and mix the Dung the better.

Choice of Sets. Procure your Sets from the beſt and largeſt Liquorice; the beſt Sets are the Crown-ſets, or heads got from the very top of the Root. Next, and near as good are the Runners, which ſpread from the Maſter-roots, and have little Sprouts and Roots which will make excellent Sets, being cut about four or five inches long. The branches alſo may be ſlipped and planted; if it prove moiſt weather, they will many of them grow; theſe may ſerve to thicken where they are too thin.

Time and manner of Setting. The uſual and beſt time for the planting of Liquorice, is in *February* and *March*; about a foot diſtance is uſual to plant your Sets in Rows by a Line, in holes made with a Setting-ſtick, deep enough

enough to contain the Plant, which as ſoon as it is in the hole, Earth it up; and if they prove dry, water them as ſoon as they are ſet; and ſo for ſeveral days, until they have recovered their witheredneſs. The firſt Year you may ſow the ground with Onions, Lettice, or ſuchlike herbs.

Then afterwards they muſt be kept Howed every Year, till they are taken up.

The Sets are impatient of being planted, after they are once out of the ground; therefore uſe what expedition you can, and Earth them up if you carry them far, and be ſure to have the ground ready before the Sets.

Taking up of Liquorice, and its profit.

After it hath ſtood three Summers in the ground you may dig it up, about the Moneth of *November* or *December*; for then it weighs moſt, and will keep beſt without loſs for ſome time. It is beſt to diſpoſe of it whileſt it is new and green, becauſe it will much decay in its weight.

Some that have very good Liquoriſh have gained much by it, the better the Land is, the more is the advantage: There hath been made from fifty pound to an hundred pound of an Acre, as ſome affirm.

Improver improved.

Pontefract in *York-ſhire* is the moſt noted place for this Plant that I have heard of: Next unto that, *Godalming* in *Surry* deſerves to be remembred alſo, for the induſtry of the Inhabitants in propagating this neceſſary Plant: The long continuance of the Planting whereof in thoſe places, to the ſo great advantage of the Inhabitants, is an Argument ſufficient of the improvement it makes, there being in many other places as good Land for this purpoſe, as either of thoſe places afford.

Of Saffron. what Land is beſt for Saffron.

Engliſh *Saffron* is eſteemed the beſt in the world, it's a Plant very ſuitable to our Climate and Soyl; therefore it is our negligence that it is no more propagated: It delights in a good, dry, ſound Land, brought into perfect Tillage by Manure and good Husbandry; the better your Land is, the better may you expect your Crop. About *Midſummer* it is to be planted, ſome ſay about *March*; it is encreaſed by the Roots which yearly multiply in the ground, like unto other Bulbous Roots, or rather more. They are to be taken up, and new planted uſually once in three Years, and then may many of the Roots be obtained: They are ſet in Ranges two or three inches deep, and about two or three inches aſunder, but the Ranges about four or five inches apart, for the more convenient weeding or howing of them.

Time and manner of planting of it.

Time of the flowring and gathering of Saffron.

About *September* the Flower appears like a blew *Crocus*, and in the middle of it comes up two or three Chives which grow upright together, and the reſt of the Flower ſpreads abroad; which *Chives* being the very *Saffron*, and no more, you may gather betwixt your Fingers, and reſerve it. This muſt be done early in the morning, elſe it returns into the body of the Flower again; and ſo for about a Moneths ſpace may you gather Saffron. You muſt procure many hands, according to the quantity of your ground; you may gather two or three Crops, and then

remove it. After it hath done Flowring, it remains green all the Winter.

Drying of Saffron. Care muſt be alſo taken in the drying of it, which may be done in a ſmall Kiln made of Clay, and with a very little fire, and that with careful attendance; three pound thereof moiſt uſually making one of dry.

Profits of Saffron. One Acre may bear from ſeven to fifteen pound, and hath been ſold from twenty ſhillings a pound to five pound a pound, and may coſt about four pound *per* Acre the management thereof; which gives a very conſiderable Improvement and Advantage.

Of Madder. This is eſteemed by ſome to be a very rich Commodity, and worthy our care and coſt to propagate it, being ſo much uſed by *Dyers* in the *Dying* of their red colours, and in ſo great requeſt of the *Apothecaries* for Medicinal uſes; and a Plant alſo that delights in our Climate.

Land fit for Madder. It is to be planted in a very rich, deep, warm, and well-manured Land, digged at leaſt two or three Spade graft deep.

Time and manner of planting it. Then about *March* or *April*, as ſoon as it ſprings out of the ground, is it to be planted: The Sets are to be gathered two or three inches long, with Roots to them, and immediately planted or put into Mould, if carried far; and then ſet about a foot apart the one from the other, and kept watred till they Spring, and continually Weeded, till they have got the Maſtery of the Weeds.

The uſe and profit of Madder. At three Years end you may take it up; reſerve the *Plants* for your own uſe, and ſell the roots to the *Apothecaries*, or dry them for the *Dyers* uſe: But the deſcription and *manner* of *drying* and *Milling* thereof for that purpoſe, I leave to thoſe that are better experienced therein, or until I have obtained ſome light thereinto. The great advantage that it brings to the Planter, according as it is by ſome related, is encouragement ſufficient to any Ingenious man to make a farther enquiry and progreſs into its Nature and Method of ordering it.

Of Weld, or Dyers Weed, what Land it requires. This is a rich *Dyers* Commodity; it groweth in many places wilde, and is ſown alſo in many places in *Kent* to a very great advantage: it will grow on any ordinary or barren Land, ſo that it be dry and warm.

Manner of ſowing it. It may be ſown on Barley or Oats after they are ſown and harrowed, this requiring only a Buſh to be drawn over it: A Gallon of Seed will ſow an Acre, it being very ſmall, and is beſt to be mixed with ſome other material, as before we adviſed concerning *Clover-graſs Seed:* it groweth not much the firſt Summer; but after the Corn is gathered it is to be preſerved, and the next Summer you ſhall receive your Crop.

Gathering and ordering of it. You muſt be very cautious in the gathering of it, that the Seed be not over-ripe, for then it will fall out; if not enough, neither Seed nor Stalk will be good: It is to be pulled as they do Flax, by the Roots, and bound up in little handfuls, and ſet to dry, and then houſed: Then may you beat or laſh out the Seed, which is of good value, and diſpoſe of the Stalk and Root to

the

the *Dyer*, which is of ſingular uſe for the *Dying* of the bright *Yellow* and *Lemon-Colour*.

SECT. III.

Of Beans, Peaſe, Melons, Cucumbers, Aſparagus, Cabbage, and ſeveral other ſorts of Garden-Tillage.

Garden-beans. Of Beans in general we have already diſcourſed in this Treatiſe; only here, as it falls in our way, we ſhall ſay a little concerning the greater ſort of Garden-beans, which you plant only for the Table: They delight in a rich ſtiff Land, or any Land new broken up; they are uſually ſet between S. *Andrew*'s day and *Chriſtmas*, at the Wane of the Moon: But if it happen to freeze hard after your Beans are ſpired, it will go near to kill them all; therefore it is the ſureſt way to ſtay till the greateſt Froſts are over, until after *Candlemas*. It is a general errour, to ſet them promiſcuouſly, and too near together, when it is moſt evident, that being ſet, or otherwiſe planted in Rows by a Line, they bear much more, the *Sun* and *Air* having a more free paſſage between them: Alſo you may the better go between them to Weed, top, or gather them: Alſo you may ſow Carrots in the Intervals, which after the Stalks are drawn up, will prove a good ſecond Crop. Let the Ranges run from *South* to *North*, for the greater advantage of the *Sun*.

If you ſow or plant them in the *Spring*, ſteep them two or three days in fat water, as before is preſcribed for the ſteeping of Corn; it is better to *How* them in, than to ſet them with *Sticks* the uſual way. In the gathering of green Beans for the Table, the beſt way is to cut them off with a knife, and not, as is uſual, to ſtrip them down; for that Wound prevents the proſperity of the younger *Cods* not yet ripe: When you have gathered your early Beans, then cut off the ſtalks near the ground, and you may probably have a ſecond Crop e're the Winter approach. Theſe larger ſort of Beans yield a far greater encreaſe than the ordinary ſort; therefore it is great pity they are no more propagated in the Fields than they are, eſpecially where the ground is rich.

Of Peaſe. There are ſeveral ſorts of Garden-Peaſe ſown or planted in this Kingdom, ſome approved of for their being early ripe, and ſome for their pleaſant taſte; others for their being late ripe ſucceeding the other: The Hot-ſpurs are ripe the ſooneſt, from their time of ſowing, of any other; then ſucceeds the large white Peaſe, and ſeveral other ſorts of green, grey, and white Peaſe; then the large white Haſting, and great grey Rouncival Peaſe. There is alſo another ſort of Peaſe in ſome places, uſually called the Sugar-peaſe for their ſweetneſs; they are to be eaten in their Cods, which grow crooked and uneven; their extraordinary ſweetneſs makes them liable to be devoured by the Birds, unleſs you take great care to prevent them. Theſe are ſown later than the other, by reaſon of their tenderneſs.

A fat rich Garden-Mould yields the largeſt Peaſe; but a light, warm, and ordinary Soyl, yields the tendereſt and ſweeteſt.

If you would have the earlieſt Peaſe, ſow them in *September* or *October*, that they may get ſome Head before the Froſts take them; and then with due care may they be preſerved over the Winter, and will bear very early. Alſo to have them very late, ſow them a little before *Midſummer*, and ſo may you have Peaſe in *September*.

As for the manner of ſowing, it is divers; ſome ſow at random, as they ſow Corn; which is altogether to be diſapproved of, becauſe they cannot be ſo evenly diſperſed, nor at ſo equal a depth, as in the other ways: Others ſet them in Ranges with a Dibble or Setting-ſtick; which is a very excellent way both to ſave Peaſe, and to give liberty to paſs between for the *Howing, gathering, &c.* But that which is moſt uſed, and beſt approved of, is the Howing of them in, which makes a quick riddance of the work, and covers all at a certain depth, and doth not ſadden or harden the ground as ſetting doth.

It is good to make the Ranges at ſome reaſonable diſtance, that you may the more conveniently paſs between them to *How* the Weeds, and Earth up the Roots in the *Spring*: for the nakedneſs and barrenneſs of the ground, adds much to the Maturation of the Peaſe, by the Reflection of the Sun; and the laying up the Earth at the Roots, preſerves them much from Drought.

Where your ground is ſmall, or that you can eaſily furniſh your ſelf with *ſticks*, they will yield a greater encreaſe if they have *ſticks* to climb on. But this, and ſeveral other ways of ordering them, we leave to the pleaſure and skill of every one, whoſe curioſity and delight is exerciſed in ſuch Affairs.

Of French-beans. Of all the ſorts of *Codware*, there is none ſo fruitful, nor multiplies ſo much, as doth the *French* or *Kidney-bean*; being alſo a very pleaſant, curious and wholeſom food, and deſerves a greater place and proportion of Land in our Farm, than is uſually given it: It is a Plant lately brought into uſe among us, and not yet ſufficiently known; the greateſt impediment to its farther Propagation, is the tenderneſs of it at its firſt ſpringing, and the ſweetneſs of it, which makes it more liable to be devoured by Snails, Worms, *&c.* But a little care and induſtry beſtowed about them, will be plentifully recompenced in the fruitful Crop; the ſeveral uſes whereof, as well for the *Kitchin*, as for the feeding of *Beaſts* and *Fowl*, are not yet commonly known or practiſed.

Of Melons and Cucumbers. Theſe being meerly Fruits raiſed for our pleaſure in the Summer-time, and not of any general uſe nor advantage to the Husbandman, we ſhall therefore paſs them by, only as to the ordering of the ground. For the ſetting and raiſing them early, ſee more at the end of this Chapter.

Of Pompions. The beſt way for the raiſing of Pompions, is to plant the ſeeds firſt in a good Mould, in a warm place, and then to tranſplant them

them into a rich dungy Bed made for that purpoſe, watring them now and then with water wherein Pigeons-dung hath been infuſed; then take away, about bloſſoming time, all the by-ſhoots, leaving only one or two main Runners at the moſt, and ſo ſhall you have them grow to an huge bigneſs. Take heed you hurt not the heads of the main Runners.

Of Artichoaks. The Artichoak is one of the moſt excellent Fruits of the *Kitchin-garden*, and recommended not only for its goodneſs, and the divers manners of *Cooking* of it, but alſo for that the Fruit continues in ſeaſon a long time.

The ground is to be very well prepared, and mixed ſeveral times with good dung, and that very deep: The *Slips* that grow by the ſides of the old *Stubs* ſerve for Plants, which are to be taken and planted about *April*, when the great *Froſts* are over, and kept watred till they are firmly rooted; and if they be ſtrong, they will bear heads the *Autumn* following. They are to be planted four or five foot diſtance the one from the other, if the *Soyl* be rich; but if it be not, then nearer. After the *Planting*, they need no other Culture before Winter, ſave only Weeding, and dreſſing ſometimes, and a little water if the Spring be dry.

Preſervation againſt Froſts. Againſt the *Winter*, before the great *Froſts*, they are to be preſerved againſt them: Some cut the leaves within a foot of the ground, and raiſe the Earth about them, in manner of a Mole-hill, within two or three inches of the top; and then cover it with *Long-dung*; which both preſerves them from *Froſts*, and keeps the Rain from rotting them.

Others put *Long-dung* about the Plants, leaving the Plant a little Breath-room in the middle, which will alſo do very well.

Others preſcribe them to be covered with an *Earthen-pot*, with a hole at the top; but a *Bee-hive* is to be preferred before it.

It is not good to *Earth* them too ſoon, leſt it rot them.

Dreſſing Artichoaks. The *Winter* ſpent, you ſhall uncover your *Artichoaks* by little and little, at three ſeveral times, with about four days interval each time, leſt the cold *Ayr* ſpoil them, being yet tender; you ſhall then *dreſs*, *dig* about, and trim them very well, diſcharging them from moſt of their *ſmall ſlips*, not leaving above three of the ſtrongeſt to each foot for Bearers, and give a ſupply to the *Roots* as deep as conveniently you can, of good fat Mould.

It will be good to renew your whole *Plantation* of *Artichoaks* every *fifth* year, becauſe the Plant impoveriſhes the Earth, and produces but ſmall Fruit.

If you deſire to have *Fruit* in *Autumn*, you need only cut the *Stem* of ſuch as have born *Fruit* in the Spring, to hinder them from a ſecond *Shoot*, and in *Autumn* theſe luſty *Stocks* will not fail of bearing very fair *Heads*, provided that you dreſs and dig about them well, and water them in their neceſſity, taking away the *Slips* which grow to their *Sides*, and which draw all the ſubſtance from the Plants.

Of Aſparagus. This Plant ſeems to contend for Preheminence with any of the *Garden*-plants for the Kitchin, being ſo delicate and wholeſome

ſome a food, coming ſo early, and continuing ſo long, as to uſher in many other of the beſt Rarities.

Planting of them. They are raiſed of ſeeds in a good fat Soyl, and at two years growth may be tranſplanted into Beds.

Which muſt be well prepared with Dung, firſt digged about two foot deep, and four foot wide, made level at the bottom; and ſo mix very good rotten Dung with ſome of the Mould, and fill them up, conſidering that it will ſink: Then plant your *Aſparagus* Plants at about two foot diſtance; you may plant three or four Rows in this Bed of four foot wide, they will in time extend themſelves throughout all the Bed.

Some curious perſons put *Rams-horns* at the bottom of the Trench, and hold for certain, that they have a kinde of *Sympathy* with *Aſparagus*, which makes them proſper the better; but it's referred to the Experienced.

Ordering and cutting of them Three years you muſt forbear to cut, that the Plant may be ſtrong, not ſtubbed, for otherwiſe they will prove but ſmall; but if you ſpare them four or five years, you will have them as big as *Leeks*.

The ſmall ones you may leave, that the Roots may grow bigger, permitting thoſe that ſpring up about the end of the Seaſon, in every Bed, to run to Seed; and this will exceedingly repair the hurt which you may have done to your Plants in reaping their Fruit.

At the beginning of the Winter, after you have cut away the *Stalks*, cover the Bed four or five fingers thick with new Horſe-dung: Some preſcribe with Earth four fingers thick, and over that two fingers of old dung, which will preſerve them from the Froſt.

At the Spring, about the middle of *March*, uncover the Beds, and take of good fat Mould and ſpread over them, about two or three fingers thick, and lay your Dung in the *Alleys*, or elſewhere, which will rot, and be fit to renew the *Mould* the next *Spring*.

Early Aſparagus. If you take up the old Roots of *Aſparagus* about the beginning of *January*, and plant them on a hot Bed, and well defend them from *Froſts*, you may have *Aſparagus* at *Candlemas*, which is yearly experimented by ſome.

When you cut *Aſparagus*, remove a little of the *Earth* from about them, leſt you wound the others which are ready to peep; cut them as low as you can conveniently, but take heed of hurting thoſe that lie hid.

Strawberries. There are divers ſorts of this moſt pleaſant and delicious Fruit, and not any of them but are worthy of our care, and that little pains they require in Nurſing them up.

The greater ſort delight in a new-broken Bed, or at leaſt in ſuch places where they have not grown before: They muſt be kept ſtringed, and removed every two or three years, and then will yield a very great encreaſe: They delight moſt in warm ſandy Soyl: the beſt Plants are ſaid to be ſuch as come of the Strings; they bear beſt in the ſhade.

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The white Strawberry, and the ordinary red, may be either planted in Beds, or on the ſides of the Banks, at your pleaſure.

The ordinary red grows plentifully in the new-fallen *Copſes*, from whence if you take your Plants about *Auguſt*, you will have a very fair encreaſe.

There is a ſort of green *Strawberry* (though not uſual) that lies on the ground under the tall and ſlender leaves, exceeding ſweet in taſte, and of a very green colour.

Alſo there is another ſort of *Strawberry* of a very excellent *Scarlet-colour*, and moſt pleaſant taſte, that grows plentifully in *New-England*, and will proſper very well with us, as is experienced by a Merchant at *Clapham* near *London*, who hath many of them growing in his *Garden*.

To preſerve them over the *Winter* (though they ſeldom die) you ſtrow a little Straw, Litter, Fern, or ſuchlike over them.

To have *Strawberries* in *Autumn*, you may only cut away the firſt bloſſoms which they put forth, and hinder their bearing in the *Spring*, and they will afterwards blow anew, and bear in their latter ſeaſon: I have gathered many on *Michaelmas*-day. *Late Strawberries.*

As ſoon as your *Strawberries* have done bearing, cut them down to the ground; and as often as they ſpire, crop them, till towards the Spring: When you would have them proceed towards bearing, now and then as you cut them, ſtrew the fine Powder of dried *Cow-dung* (or Pigeons-dung, or Sheeps-dung, *&c.*) upon them, and water them when there is cauſe. *Large Strawberries.*

The *Cole-flower* is an excellent Plant, and deſerves a place in the *Kitchin-garden*; their ſeeds are brought out of *Italy*, and the *Italians* receive it from *Candia*, and other of the *Levantine* parts, which is the beſt, and produces the largeſt Heads.

You may either ſow the ſeeds in *Auguſt*, and carefully preſerve them over the *Winter*, or you may raiſe them in your hot Beds at the Spring, and remove them when they have indifferent large leaves into good Land prepared for that purpoſe; but the beſt way is to dig ſmall Pits, and fill them with good, rich, light Mould, and therein plant your *Cole-flower*, which muſt be carefully watered.

There are divers ſorts of *Cabbages*, and of ſeveral colours and forms; but we ſhall here take notice of no more than the ordinary *Cabbage* and *Colewort*, being ſufficient for our *Country-Kitchin*. *Cabbages and Colewarts.*

The Seed is to be ſown between *Midſummer* and *Michaelmas*, that it may gain ſtrength to defend it ſelf againſt the violence of the *Winter*; which nevertheleſs it can hardly do in ſome years: or you may raiſe them on a hot Bed in the *Spring*.

In *April*, or about that time, they are to be tranſplanted into a very rich and well-ſtirred Mould; if you expect the largeſt *Cabbages*, they delight moſt in a warm and light Soyl, and require daily watering till they have taken Root.

In any ordinary ground, being well digged and wrought, may you raiſe great quantities of ordinary *Cabbages* and *Colewarts*.

If you intend to reserve the seed, let it be of your best *Cabbages*, placed low in the ground during the *Winter*, to preserve them from the great Frosts and cold Winds; cover them with *Earthen-pots*, and warm soyl over the Pots, and at *Spring* plant them forth.

Savoys. There is another sort of Cabbage, commonly called the *Savoy*, being somewhat sweeter and earlier than the common Cabbage; and therefore to be preferred: It is raised and planted as the other, as also is the small Dutch Cabbage.

Lettuce. This is so common a Sallet-herb either raw or boiled, and the way of propagating thereof so easie, that I may the better pass it by.

Only if you have a desire to have them white, or *blanch* them, (as the French term it) then when they are headed or loaved, in a fair day, when the Dew is vanished, binde them about with *long Straw*, or *raw Hemp*; or more speedily, you may cover every Plant with a small Earthen-pot, and lay some *hot Soyl* upon them, and thus they will quickly become white.

Of Beets. This ordinary Plant is by several made use of; it loves a fat and rich Soyl; it's usually sown in the Spring, and will come up several years in the same ground, and may be planted forth as Cabbages are.

Of Anise. *Anniseeds* may also be propagated in *England*, as some have already experienced, by sowing them in *February* between the Full and Change of the Moon; then strow new Horse-dung upon them to defend them from the Frosts. These will ripen about *Bartholomew-tide*; then also may you sow again for the next year.

Let your ground be well stirred about *Michaelmas*, for that which you sow in *February*; the black rich mellow-ground is the best.

SECT. IV.

Of Carrots, Turneps, and other Roots useful in the Kitchin.

Of Carrots. This is one of the most Universal and necessary Roots this Country affords, only they will not prosper in every ground; they principally delighting in a warm, light, or sandy Soyl; or if others, it must be well stirred and manured: but if the ground be naturally warm and light, though but indifferently fertil, yet will they thrive therein: It is usual to sow them in the Intervals between the Beans, in digged, not in ploughed Land, because of extending their Roots downwards: After the Beans are gone, they become a second Crop; the best are for the Table, the other for the feeding or fatting of Swine, Geese, *&c.* some of the fairest laid up in reasonable dry Sand, will keep throughout the *Winter*. The fairest of them may you reserve till the Spring, and plant them for Seed.

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As to the general way of propagating them, we have already given you a hint; therefore have we little more to ſay, but that for your *Kitchin*-uſe you may ſow them at ſeveral times; and if the Weather, the Birds, or the Worm deſtroy them, you may renew your labour and coſt for a ſmall matter. After they are in their prime, you muſt houſe them from the Froſt, by laying them in your Celler, or ſuchlike place, on heaps. *Turneps.*

This is an excellent ſweet Root, and very pleaſing to ſome people; it is to be ſown in the Spring, in a rich, mellow, and well-ſtirred Soyl. When they are grown to any bigneſs, tread down the tops, which will make the Roots grow the larger: The like may be done to Carrots, Turneps, or any other Roots. Towards the Winter, when you raiſe them, they may be diſpoſed of in Sand, to be preſerved as Carrots, Turneps, *&c.* The faireſt may be kept for Seed, as before of Carrots; and then take the faireſt and talleſt tops of thoſe ſeeds in the Summer and ſow them, and by this means may you attain the faireſt Roots. *Parſneps.*

The *Skirret* is ſweeter than any of the former Roots; they delight in a very fat and light Mould, and are raiſed of the Slips, being planted in the Spring-time in Ranges, about five or ſix inches aſunder: At the *Winter*, when you raiſe the Roots, you may lay the tops in *Earth* till the *Spring*, for your farther encreaſe. *Of Skirrets.*

They are ſo commonly known, and their propagation ſo eaſie, that here needs no more to be ſaid of them. *Of Radiſhes.*

Theſe are very uſual in Forreign parts, and are planted in ſeveral places of this Country to a very good advantage; they are eaſily encreaſed, by cutting the Roots in ſeveral pieces, each piece growing as well as the whole Root; they require a good fat Garden-mould, but will grow indifferently well in any: they are commonly eaten either Buttered, or in Milk. I do not hear that it hath been as yet eſſayed, whether they may not be propagated in great quantities for food for Swine, or other Cattle. *Of Potatoes.*

Theſe are near of the *Nature* of the *Potatoes*, but not ſo good nor ſo wholeſome; but may probably be propagated in great quantities, and prove good food for Swine: They are either planted of the Roots, or of Seeds. *Of Jeruſalem-Artichoaks.*

Onions are Roots very much in requeſt for their ſeveral and divers uſes they are put unto in the Kitchin; they delight in a fine, fat, and warm Mould, and are to be ſown in *March*, or ſoon after; but if you ſow them ſooner, you muſt cover them at the firſt: where they come up too thick, they may be drawn and planted where they are thinner; when they are grown to ſome reaſonable bigneſs, you ought to bend down, or tread the Spindle or Stalk, which will make the head the larger: being ſown with Bay-ſalt, they have proſpered exceeding well. In *Auguſt* they are uſually ripe; then are they to be taken up and dried in the Sun, and reſerved for uſe, in places rather dry than moiſt. *Of Onions.*

Of Garlick. This is ſo Univerſally known and propagated, that I need ſay little of it: If ſet in rich ground, it encreaſes to admiration; and may be Annually multiplied, without hazard of Weather: keeping down the Leaves makes the Root large.

Of Leeks. They are ſown as the *Onions*, and afterwards it is beſt to tranſplant them deep, that they may have a great deal of *White-ſtalk*, one ſuch *Leek* being worth two others.

The faireſt and biggeſt of *Leeks* and *Onions* are to be reſerved and planted for Seed; the ſtalks whereof are to be propped up with ſticks, by reaſon of their weight: When the Seed is ripe, reſerve the Heads on ſome Cloth, and let them be through dry e're you rub them out.

There are ſeveral ſorts of *Kitchin-herbs* and Plants very neceſſary and uſeful, and alſo profitable to be propagated and advanced in our *Country-gardens*; as *Thime*, *Hyſſop*, *Sage*, *Roſemary*, *Marjerom*, *Violets*, and ſeveral others: Their ways and manner of Planting being ſo Univerſally known, and not altogether pertinent to our diſcourſe, I ſhall paſs them by, and refer you to others that treat of them.

Tobacco. I thought to have omitted this Plant, by reaſon the Statute-Laws are ſo ſevere againſt the Planters of it, but that it is a Plant ſo much improving Land, and imploying ſo many hands, that in time it may gain footing in the good Opinion of the Landlord, as well as of the Tenant, which may prove a means to obtain ſome liberty for its growth here, and not to be totally excluded out of the Husbandmans Farm. The great Objection is the prejudice it would bring to Navigation, the fewer Ships being imployed; and the leſſening his Majeſties Revenue. To which may be anſwered, that there are but few Ships imployed to *Virginia*; and if many, yet there would be but few the leſs; for it's not to be imagined, that we ſhould Plant enough to furniſh our whole Nation, and maintain a Trade abroad alſo: And in caſe it ſhould leſſen the number of Ships for the preſent, they would ſoon encreaſe again, as the Trade of *Virginia* would alter into other Commodities, as *Silk*, *Wine* and *Oyl*, which would be a much better Trade for them and us.

And as to the leſſening his Majeſties Revenue, the like Impoſition may be laid on the ſame Commodity growing at home, as if imported from abroad, or ſome other of like value in lieu of it.

Certain it is, that the Planting of it would imploy abundance of people in Tilling, Planting, Weeding, Dreſſing and Curing of it. And the improvement of Land is very great, from ten ſhillings *per* Acre, to thirty or forty pound *per* Acre, all Charges paid: before the laſt ſevere Laws, many Plantations were in *Glouceſterſhire*, *Devonſhire*, *Somerſetſhire*, and *Oxfordſhire*, to the quantity of many hundreds of Acres.

Some object, that our Engliſh-Tobacco is not ſo good as the Forreign; but if it be as well reſpected by the Vulgar, let the more Curious take the other that's dearer. Although many are

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of Opinion that it's better than Forreign, having a more *Haut-guſt*, which pleaſeth ſome; if others like it not, they may in the curing of it make it milder, and by that means alter or change it as they pleaſe: It hath been often ſold in *London* for *Spaniſh* Tobacco.

The beſt way and manner of Planting and Curing it, would be eaſily obtained by experience: many attempting it, ſome would be ſure to diſcover the right way of ordering of it, and what ground or places it beſt affects.

But that which hath been obſerved is, that it affects a rich, deep and warm ſoil well dreſſed in the Spring before Planting time: The Young Plants raiſed from ſeed in *February* or *March*, on a hot Bed, and then planted abroad in your prepared ground, from whence you may expect a very good Crop, and ſometimes two Crops in a year. The leaves, when gathered, are firſt laid together on heaps for ſome time, and then hang'd up (by Threads run through them) in the ſhade, until they are through dry, and then put up and kept, the longer the better. In this, Experience is the beſt Maſter.

SECT. V.

Of the manner of ordering and preparing of Garden-Ground, making of hot Beds, and Watering of the Gardens, &c.

There are many *Garden-plats* in *England*, which either for their cold ſcituation, or the cold or unnatural temper of the ſoil, or ſuchlike impediments; and by reaſon of the ignorance of the *Gardiner*, or Owner thereof, produce little or no Fruit or Tillage anſwerable to the coſts, trouble, or expectation of the *Owners* thereof: Wherefore we ſhall give you here the beſt *Rules*, Directions, and Inſtructions we either know, or have read of in any of our Ruſtick Authors.

The ſeveral ways of tempering mould.

If the Land be of a light and warm Nature of its ſelf whereof your Garden is made, there needs only common *Horſe-dung* or *Cow-dung* to be mixed therewith in the digging or trenching, to inrich it: but if the *Ground* or *Mould* incline to a cold Clay, or ſtiff ground, then procure ſome good, light and fertil *Sand*, or *Mould* of that nature, and mix with your *Dung* in ſome corner of your ground equally together, and ſuffer it ſo to lie and rot over the *Winter*, which in the *Spring* will prove an excellent warm Manure to lay to the roots of your Plants, or to make whole Beds thereof, by mixing it in good quantities with the natural ſoil; and if you can procure it with conveniency, the more of *Pigeons-dung*, *Poultry-dung*, or *Sheeps-dung* you mix with it, the lighter and warmer it will be. Alſo an equal compoſition or mixture of Dung and Earth is neceſſary to be laid by, that it may be throughly rotten and turned to *Earth* by the *Spring*, that it may then be fit to renew the Earth about your *Hops*, *Artichoaks*,

choaks, and ſuchlike; and alſo for the planting and ſowing therein *Coleflowers*, *Cabbages*, *Onions*, &c.

The beſt way of ſowing Garden-ſeeds. The beſt and ſureſt way of ſowing ſeeds to have the moſt advantage of ſuch Dung or ſoil, and that they may come up moſt even, and be all buried at one certain depth, is thus: Firſt rake your Bed even, then throw on a part of your mixture of Earth and Dung, which alſo rake very even and level, on which ſow your ſeeds, whether *Onions*, *Leeks*, *Lettice*, or ſuchlike; then with a wide Sieve ſift on the Earth mixed with Dung, that it may cover the Seeds about a quarter of an inch deep, or little more, and you ſhall not fail of a fruitful Crop.

To lay ground warm and dry. If your Garden be obvious to the cold winds, which are very injurious to moſt ſorts of Plants, next unto Trees, Pales, Walls, Hedges; *&c.* lay your ground after this following manner; that is, let it be laid up in Ridges a foot or two in height, ſomewhat upright on the back or *North-ſide* thereof, and more ſhelving or ſloping to the *Southward*, for about three or four foot broad, on which ſide you may ſow any of your Garden-Tillage; and theſe Banks lying one behinde the other, will much break the Winds, and theſe ſhelving ſides will much expedite the ripening of Peaſe or other Fruits, by receiving more directly the Beams of the Sun: and in caſe the ground be over-moiſt, you may plant the higher; and if over-dry, then the lower: ſo that it ſeems to remedy all Extreams, except Heat, which rarely injures.

The making of hot Beds. To make a hot Bed in *February*, or earlier, if you pleaſe, for the raiſing of *Melons*, *Cucumbers*, *Radiſhes*, *Coleflowers*, or any other tender Plants or Flowers, you muſt provide a warm place defended from all Winds, by being incloſed with a Pale or Hedge made of Reed or Straw, about ſix or ſeven foot high, of ſuch diſtance or capacity your occaſions require; within which you muſt raiſe a Bed of about two or three foot high, and three foot over, of new Horſe-dung of about ſix, eight, or ten days old, treading it very hard down on the top, being made level; and if you will, edged round with boards; lay of fine rich Mould about three or four inches thick; and when the extream heat of the Bed is over, which you may perceive by thruſting in your finger, then plant your ſeeds as you think fit; then erect ſome Forks four or five inches above the Bed, to ſupport a Frame made of ſticks, and covered with Straw, to defend the Seed and Plants from cold and wet; only you may open your Covering in a warm day for an hour before Noon, and an hour after. Remember to Earth them up as they ſhoot in height; when they are able to bear the cold, you may tranſplant them.

Of watering of Plants. Many curious and neceſſary Plants would ſuffer, were they not carefully watered at their firſt removal, or in extream dry ſeaſons; therefore this is not to be neglected. Early in the Spring, whileſt the Weather is cold, be cautious of watering the leaves of the young and tender Plant, only wet the Earth about it.

When your Plants or Seeds are more hardy, and the Nights yet cold, water in the Fore-noons; but when the Nights are warm,

warm, or the days very hot, then the Evening is the beſt time.

If you draw your water out of Wells, or deep Pits, it ought to ſtand a day in the Sun in ſome Tub, or ſuchlike, for your tender Plants in the Spring.

But Pond, or River, or Rain-water needs it not, and is to be preferred before Well-water, or Spring-water.

If you infuſe *Pigeons-dung*, *Sheeps-dung*, *Hen-dung*, *Aſhes*, *Lime*, or any fat ſoil or matter in your water, either in Pits, Ciſterns, or other Veſſels for that purpoſe, and therewith cautiouſly water your Plants; it will much add to their encreaſe and multiplication.

For Cole-flowers, Artichoaks, and ſuch like, let the ground ſink a little round the Plant, in form of a ſhallow Diſh, the water will the better and more evenly go to the Roots.

Water not any Plant over-much, leſt the water carry with it away the Vegetative or fertil Salt; and ſo impoveriſh the ground, and alſo chill the Plant.

It is alſo better to water a Plant ſeldom and throughly, than often and ſlenderly; for a ſhallow watering is but a deluſion to the Plant, and provokes it to root ſhallower than otherwiſe it would, and ſo makes it more obvious to the extremity of the Weather.

If you are willing to have the ground always moiſt about any Plant, place near it a Veſſel of water, putting therein a piece of Woollen Cloth or Liſt, and let the one end thereof hang out of the Veſſel to the ground, the other end in the water, in manner of a *Crane*: Let the Liſt or Cloth be firſt wet, and by this means will the water continually drop till all be dropped out of the Veſſel, which may then be renewed. The end that hangs without the Veſſel muſt be always lower than the water within the Veſſel, elſe it will not ſucceed: If it drop not faſt enough, encreaſe your Liſt or Cloth; if too faſt, diminiſh it.

If the Weather be never ſo dry when you ſow any ſort of Seeds, water them not till they have been in the ground ſeveral days, and the ground a little ſetled about them.

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CHAP. IX.

Of several sorts of Beasts, Fowls and Insects, usually kept for the Advantage and Use of the Husbandman.

OUR Country-Farm is of little use and benefit to us, notwithstanding all our care, pains and cost in Fencing, Planting, or otherwise ordering the same, unless it be well stocked and provided with Beasts, and other Animals; as well for labour and strength in Tilling and Manuring the Ground, and facilitating other Labours and Exercises, as for the furnishing the Market and Kitchin.

SECT. I.

Of Beasts.

Of the Horse. The *Horse* hath the Preheminence above all others, being the Noblest, Strongest, Swiftest, and most necessary of all the Beasts used in this Country for the *Saddle*, for the *Plough* and *Cart*, and for the *Pack*.

Where you have good store of Pasture, either in Several, or in Common, or in Woods or Groves, it is no small advantage to keep a *Team* of *Mares* for the Breed; but where there is most of Arable, and little of Pasture-Land, *Horses* or *Geldings* are more necessary: which difference we may observe between the great *Breeding-places* for *Horses* in the Pastures and Wood-lands, and the naked Corn-Countries; the one full of gallant lusty *Mares*, the other of *Horses* and *Geldings*.

As to the Shape and Proportion, Colours, Age, Ordering, Breeding, Feeding, and Curing the several Diseases of *Horses*, I shall here be silent, and refer you to the several *Authors* who have copiously treated of that Subject, it being too large for this place.

Of the Ass. *Asses* are commonly kept, yet not to be little set by, because of their sundry Commodities, and the hardness of their Feeding: for this poor Beast contents himself with whatsoever you give him; Thistles, Bryars, Stalks, Chaff, (whereof every Country hath store) is good Meat with him: Besides, he may best abide the ill looking to of a negligent Keeper, and be able to sustain blows, labour, hunger and thirst, being seldom or never sick; and therefore of all other Cattle longest endureth: for being a Beast nothing chargeable, he serveth for a number of necessary uses: in carrying of Burdens he is comparable to the *Horse*; he draweth

draweth the Cart (ſo the Load be not great) for grinding in the Mill he paſſeth all others. Thus far *Haresbatch.*

The Milk alſo of the *Aſs* is eſteemed an excellent Reſtorative (by moſt Learned Phyſitians) in a Conſumption.

But I preſume one main impediment of their not being ſo frequently kept, is their deſtructive Nature to Trees, which they will bark with their mouths where they can come at them: This is no ways pleaſing to a good Husband.

Of the Mule.

The *Mule*, or *Moil*, is bred of a *Mare* covered with an *Aſs*: It's a hardy Beaſt, much better than an *Aſs*, and very tractable and capable of much ſervice.

Of cows and Oxen.

Theſe worthy ſort of Beaſts are in great requeſt with the Huſbandman, the *Oxe* being uſeful at his Cart and Plough, the *Cow* yielding great ſtore of Proviſion both for the Family and the Market, and both a very great advantage to the ſupport of the Trade of the Kingdom.

Concerning their form, nature and choice, I need ſay little, every *Countryman* almoſt underſtanding how to deal for them.

The beſt ſort is the large *Dutch Cow* that brings two *Calves* at one Birth, and gives ordinarily two Gallons of Milk at one Meal.

As for their breeding, rearing, breaking, curing of their Diſeaſes, and other ordering of them; and of *Milk*, *Butter* and *Cheeſe*, *&c.* I refer you to ſuch Authors that do more largely handle that Subject than this place will admit of.

Of Sheep.

Next unto theſe, the *Sheep* deſerves the chiefeſt place, and is by ſome preferred before any other, for the great profit and advantage they bring to Mankinde, both for Food and Apparel.

Whereof there are divers ſorts, ſome bearing much finer Wooll than others; as the *Herefordſhire-Sheep* about *Leiceſter* bear the faireſt Fleeces of any in *England.* Alſo they are of ſeveral kinds, as to their proportion; ſome are very ſmall, others larger: But the *Dutch-ſheep* are the largeſt of all, being much bigger than any I have ſeen in *England*, and Yearly bear two or three *Lambs* at a time. It is alſo reported, that they ſometimes bear *Lambs* twice in the Year. It may doubtleſs be of very good advantage to obtain of thoſe kindes; and alſo of *Spaniſh-ſheep* that bear ſuch fine *Fleeces.*

As for their breeding, curing and ordering, I refer you (as before) to ſuch Authors that have largely treated of them.

Of Swine.

This Beaſt is alſo of a very conſiderable advantage to the Husbandman, the Fleſh being a principal ſupport to his Family, yielding more dainty Diſhes and variety of Meat, than any other Beaſt whatſoever; conſidering them as *Pig*, *Pork*, *Bacon*, *Brawn*, with the different ſorts of *Offal* belonging to them: Alſo they are of the courſeſt Feed of any Creature whatſoever; being content with any thing that's Edible, ſo they have their fill, for they are impatient of hunger.

It is a great neglect that they are no more bred and kept than they are, their Food being obtained at ſo eaſie a rate: Beſides,

the *Offal* of *Corn*, *Whey*, and other *Culinary* Proviſion, it cannot but prove a very conſiderable advantage to ſow or plant Land on purpoſe with *Coleworts*, *Kidney-beans*, and ſeveral other groſs thriving Pulſes, Plants and Roots; whereby you may not only raiſe a conſiderable ſtock of them, to your great gain and profit, if old *Tuſſer* ſaid true:

And yet by the Year have I proved e're now,
As good to the Purſe is a Sow as a Cow.

but alſo by their Treading and Batling, in caſe they be kept in a Court made ſeveral for that purpoſe, they will convert all ſuch Vegetables they eat not into excellent Soil.

If they are ſuffered to run abroad, they waſte their fleſh much: therefore it is eſteemed the moſt frugal and beneficial way, to keep them always penned into ſome Court, both for their fleſh and ſoil.

Of Goats. Theſe are kept in ſome places for advantage, being a very courſe Feeder. The *Kids* are eſteemed good Meat: their Hair alſo is of uſe to make Ropes, and other things; it never rots in the water. The beſt ſort of them breeds twice in the Year: they are uſually kept in Stables where many Horſes are, to preſerve them from ſeveral Epidemical Diſeaſes.

The Milk of *Goats* is eſteemed the greateſt Nouriſher of all liquid things whereon we feed, (except Womans Milk) and the moſt comfortable to the ſtomack; from whence the *Poets* feign, that their God *Jupiter* himſelf was nouriſhed with *Goats-milk*.

They crop, and are injurious to young Trees; therefore are to be kept with much caution.

Of Dogs. Although they are not eſteemed amongſt the number of profitable Cattle, yet are they very neceſſary ſervants, and the moſt obſervant and affectionate of all Beaſts whatever to Mankinde: Their love, even to the loſs of their lives, in defence of their *Maſter*, his *Cattle*, *Goods*, &c. their officiouſneſs in Hunting, and ſeeking after all ſorts of *Prey* or *Game*, are ſo commonly known, and ſo frequently made uſe of, that it's needleſs to tell you ſo.

Only that they are of different ſorts and natures; ſome as a *Guard* to defend your *Houſe* and *Goods*, others as *Shepherds* to defend your *Sheep* and *Cattle*, others as *Jaccals* or *Watchmen*, always wakeful to rouze up the heavy *Maſtiffs*; whereof ſome are for the *Bear*, others for the *Bull*.

Some *Dogs* alſo are for the *Game*; as for the *Stag*, *Buck*, *Fox*, *Hare*, *Coney*, *Pollcat*, *Otter*, *Weeſel*, *Mole*, &c. Alſo for the *Duck*, *Pheaſant*, *Partridge*, *Quayl*, *Moor-hens*, and ſeveral other ſorts of Land and *Water-fowl*.

Others alſo are kept for their Beauty, Shape and Proportion, and for their docible Nature, being apt to Dance and perform ſeveral other Acts of Activity, *&c.*

Coneys. Beſides the wilde, which are very profitable in Warrens, tame *Coneys* may be kept to a very great advantage, either in Hutches

ches or in Pits, which is much to be preferred. Theſe Pits are ſunk about ſix or ſeven foot deep, in a good light Mould; or in Chalk or Sand they delight moſt. Theſe are to be made round or ſquare, and walled with Stone or Brick, to preſerve the Earth from foundring, in leaving places on the ſides for the *Coneys* to draw and make their Stops or Buries.

At the one end or ſide make a hollow place for the *Buck* to reſt in, chaining him to a ſmall ſtump, that he may have liberty to go to the Rack to feed, and to his Den to reſt: On the other ſide or end, let the places be left for the *Does* to make their ſtops in.

About the middle of the Pit may you place the Rack to feed them in; the *Buck* on the one ſide, and the *Does* on the other.

In a Pit of about ten foot ſquare may be kept two or three *Does*, (beſides the *Buck*) which will bring each of them about fifty or more Young ones in a year, ſometimes ſeventy or eighty. When they are about a Moneth old, you may take them out of the Pit, and either ſpend them, or feed them in another Pit or place made for that purpoſe.

Their Food is for the moſt part Greens growing in and about your Gardens; as Carrots and their Greens, Coleworts, Sowthiſtles, Malloes, Dandilion, Saxifrage, Parſley, Graſs, and many other. Alſo Hay, Bran, Grains, Oats, *&c.*

They ought to be conſtantly fed and cleanſed, and great care taken to keep them from Cats, Pollcats, *&c.*

If you have much Garden-ground, and a good ſoil free from Water, Clay or Stone for them to breed in, they will thrive exceedingly, and doubly repay your care and trouble.

By feeding them with dry Meat between whiles in the Winter-ſeaſon, it preſerves them from the Rot, which in moiſt weather they are ſubject unto; but if you feed them much with dry Meat, you muſt ſet them water, otherwiſe not.

The black or ſilver-haired are moſt uſually kept tame, their skins being of great value. *Their kinds.*

The great *Dutch-Rabbit* is the beſt for their food, being much larger than the other.

But the white *Shock-Rabbit* of *Turkie* is the moſt pleaſant, having long and fine hair, and is now become the moſt in Mode.

SECT. II.

Of Fowl.

The *Countrymans* Farm or Habitation cannot be ſaid to be compleatly ſtored or ſtocked without *Fowl*, as well as Beaſts, yielding a conſiderable advantage by their Eggs, Brood, Bodies, and Feathers, amongſt which the *Poultry* ſeems to have the Preheminence, being more univerſally kept than any other ſort whatſoever; inſomuch that any poor *Cottager* that lives by the High-way-ſide may keep of them, being able to ſhift for them- *Of Poultry.*

ſelves the moſt part of the Year, ſeeding on *Inſects*, and on any thing almoſt that's Edible by any other ſort of Animal.

Profit of Poultry. They are alſo kept to a very great advantage in the Back-ſides, and at the Barns-doors of great Farms; and as I have been certainly informed, a good Farm hath been wholly ſtockt with *Poultry*, ſpending the whole Crop upon them, and keeping ſeveral to attend them; and that it hath redounded to a very conſiderable Improvement. It ſeems alſo conſonant to Reaſon, eſpecially if within a days Journey of *London*, that they might have a quick Return, and a good Market, being in a capacity to furniſh the Market, throughout the Year, either with *Eggs*, *Chickens*, *Pullets*, *Capons*, or *Cocks* and *Hens*. Alſo the Feathers muſt needs yield a conſiderable advantage; and the Dung of *Poultry* being of great uſe on the Land, much exceeding the Dung of any Cattle whatſoever.

Feeding and fatting of Poultry. Therefore if convenient places or houſes were made for them, as dark as may be, which doth much expedite their fatning; and the *Poultry* there fed, and their Dung reſerved, and before it hath taken wet, let it be mixed with Earth, it will undoubtedly anſwer the expence of a great part of the Corn you feed them withal.

Encreaſing of Eggs. If they are fed with *Buck*, or *French-wheat*, or with *Hemp-ſeed*, they will lay more Eggs than with any other ſort of *Grain*.

Buck-wheat either grownd and made in Paſte, or whole, (the former way is the better) is the beſt ſingle fatner of Fowl; *Hemp-ſeed*, as they ſay, giving an ill ſavour to the fleſh of the Bird that feeds on it: but this only upon report; if it prove otherwiſe, it would be one great encouragement to the planting or ſowing of *Hemp*, that the Seed ſhould be of ſo great uſe.

Hatching of Eggs artificially. In *Egypt* they hatch their *Eggs* in great quantities, in *Ovens* made for that purpoſe. In ſeveral places in this Country alſo, one Hen will lead the Brood of two or three Hens, ſo that they be hatched near about a time: therefore may you with much facility hatch three or four dozen of *Eggs* in a *Lamp-Furnace* made of a few Boards, only by the heat of a Candle or Lamp; ſo that you order them that they may hatch about the ſame time that the Hen hatches her Eggs that you intend ſhall lead them; By which means in a warm Room may one Hen lead many *Chickens*, and raiſe them up with little charge, and without the loſs of time of the other Hens.

This way may be of ſingular uſe, where you keep *Poultry* of divers kindes; that is, of the largeſt kindes to Lay, and a few of the Leſſer to Sit and Nurſe up the *Chickens*.

Of Geeſe. They are a Fowl very profitable in many places where there are *Commons* to feed them on, being a *Creature* that requires little care and attendance, and little charge in feeding them.

They multiply extraordinary in ſome places, breeding twice a Year; and in all places yielding a conſiderable price.

Alſo their Feathers are no ſmall advantage, eſpecially if you ſheer them as they do Sheep, as in ſome places is uſual.

You

You may ſet them on any number of *Eggs* under fifteen, and above ſeven, giving to each *Gooſe* her own *Eggs*; for (it's ſaid) they will not hatch a ſtrangers.

The Young or *Green-Geeſe* are beſt fatted if kept dark, and fed with ground Malt and Milk mixed together. *Of fatting of Geeſe.*

The Old and *Stubble-Geeſe* will be fat the ſame way, or fed with new *Malt*.

But in fatting of *Geeſe* you may obſerve, that they uſually ſit, eſpecially in the night-time, with their *Beaks* or *Bills* on their *Rumps*, where they ſuck out moſt of their moiſture and fatneſs at a ſmall bunch of Feathers, which you ſhall finde ſtanding upright on their Rumps, always moiſt; which if cut away cloſe before you put them up to fatting, they will be fat in much leſs time, and with much leſs Meat than otherwiſe. *A principal Obſervation in fatting of Geeſe.*

They will feed on, and fatten alſo with Carrots cut ſmall, and given them.

The *Jews*, who are eſteem'd the skilfulleſt Feeders that be, do wrap the *Gooſe* in a Linnen Apron: they hang her up in a dark place, ſtopping her Ears with Peaſe, or ſome other thing, that by neither hearing nor ſeeing of any thing, ſhe be not forced to ſtruggle nor cry. After they give her Pellets of *Ground-malt* or *Barley*, ſteeped in water thrice a day, ſetting by them water and gravel; by which manner of feeding they make them ſo fat, that it is almoſt incredible. *The Jews manner of fatting Geeſe.*

I have heard it alſo confidently affirmed and related by one, that in *France* he ſaw *Carps* fatted, by being bound with their Noſes upright, and daily fed with white-bread and Wine: whether their bodies were in the water or no, I remember not. This, as he affirmed, made the *Carps* exceeding fat and pleaſant.

Moſt certain it is, that darkneſs doth much conduce to the fatning of any Creature; and alſo reſt and ſleep, as appears by the *Bears* and *Foxes* in the *Northern Climates*.

Gravel alſo not a little availeth, it being uſual that when *Poultry* are penned up, and have loſt their appetite, being ſet where *Gravel* is, will greedily eat it.

Tame *Ducks* being much of the nature of *Geeſe*, we ſhall ſay the leſs of them, only that they require more water to dabble in than do the *Geeſe*, and that they are not ſo good Meat. There are ſome ſorts of them that lay great ſtore of *Eggs*, which are more to be preferred, and are diſtinguiſhed from the other by the turning up of their *Bills*, more than the other ſorts. *Of Ducks.*

There are alſo a certain ſort of *Ducks* kept only to draw unto them, and, as it were, Trapan whole Flights of *Wilde-Ducks*, and bring, or conduct them to the places of their retirement, which are Pools made on purpoſe: The manner and form whereof, and alſo of the breeding of theſe ſorts of *Ducks*, and the taking of the wilde-Fowl they bring with them, we leave to the more skilful in that Exerciſe to treat of. *Of Decoy-Ducks.*

Turkeys, or *Ginney-hens*, or *Cocks*, are a melancholy Fowl, as appears by their doleful cry, and the anger that they ſeem to have *Of Turkeys.*

have againſt red colours, being poſſeſt with a ſtrong conceit that they are mocked, by reaſon their own *Combs* or *Wattels* are red. They are a great Feeder, devouring more than they are worth by far, if they are fed with Corn; but if let at liberty, and have Ranging room enough, they feed on Herbs, or the Seeds of Herbs, without any great charge or trouble, except in the breeding; at which time they require careful attendance, being an extream chill Bird.

Some having the conveniency of a Wood or Grove near their houſe, have let the *Hen-Turkeys* take their liberty and ſeek their own Neſts, and take care of their Young; which they will do, concealing their Neſts from the *Cock*, and bring up their Brood with much better ſucceſs than the more tame.

They are ſeldom very fat till the Winter be well ſpent, that they forget their Luſt: the cold weather gets them a ſtomack, and the long nights afford them much reſt.

Of Pigeons. Several ſorts of *Pigeons* or *Doves* there are, both wilde and tame; as *Wood-Pigeons*, or *Wood-Queſts*, *Rock-Pigeons*, *Stock-Doves*, *Turtle-Doves*: Then there are *Houſe-Pigeons*, ſuch as are uſually kept in *Dove-cots*, or *Pigeon-houſes*; and divers ſorts of *Tame-Pigeons* fed by hand, kept for their largeneſs of body, for their beauty and diverſity of colours, breeding almoſt every Moneth in the Year. But we ſhall only here treat of *Pigeons* kept in *Dove-houſes*, that bring in unto ſuch that are priviledged to keep them, a conſiderable Yearly advantage, with very little coſt or trouble, only feeding of them in the Snowy or Froſty weather, when nothing is to be had abroad, and about *Midſummer* before *Peaſe* be ripe; which time they uſually call *Benting-time*, becauſe then neceſſity inforceth them to feed on the *Bents*, or ſeed of *Bennet-graſs*, no other food being then to be had: And uſually, about that time, have they ſtore of Eggs and Young Ones, which will otherwiſe be ſtarved, unleſs you help them; but the Dung of their Houſes will in a manner ſatisfie you for their Meat, if carefully made uſe of.

To encreaſe a Stock of Pigeons. There is nothing that *Pigeons* more affect than *Salt*; for they will pick out the Mortar out of the Joynts of Stone or Brick-walls, meerly for the ſaltneſs thereof: therefore do they uſually give them, as oft as occaſion requires, a Lump of Salt, which they uſually call a *Salt-Cat*, made for that purpoſe at the *Salterns*, which makes the *Pigeons* much affect the place; and ſuch that caſually come there, uſually remain where they finde ſuch good entertainment.

The Salt-Cat.

Aſſa fetida. If *Aſſa-fetida* be boiled in water, and the holes waſhed therewith, their Feathers will bear the ſcent thereof about them; that whatſoever company they light into will be ſo well pleaſed therewith, that they will bear them company home, to the great encreaſe of your Stock.

Cummin-ſeed. This hath been always eſteemed an excellent Drawer of *Pigeons*, either by waſhing the holes with water wherein it hath been boiled, or feeding them with Meat ſteeped in ſuch water.

But

But that which hath been experienced to have had the greateſt power to draw theſe Birds from their former homes to the place you deſire, is, that you take a *Bitch* (in her heat of Luſt, or hot or ſalt, as they uſually term it) and after ſhe is Fleyed and Bowelled, bake her in an *Oven*; (ſome preſcribe to roaſt her with *Cummin-ſeed* in her Belly) then lay her in the *Pigeon-houſe*; and if you have but few Pigeons there, you ſhall ſoon finde a wonderful encreaſe. This hath been an experienced way to ſtock a decayed Houſe in a very ſhort time. *A baked Bitch.*

Theſe Birds are kept for their Beauty and magnificent deportment, being the proudeſt, moſt chaſte and jealous, and leaſt ſuſtainer of injuries of any other: their fleſh not ſo much regarded as the fleſh of other Water-fowl. *Of Swans.*

Yet is the *Cignet* a Noble Diſh at great Entertainments, which may be fatted and made the more acceptable, by keeping them apart in a cloſe Pond, out of which they cannot get, having only a little dry Graſs-plat to ſit and prune themſelves in. Near to the water you ſhall place Tubs or ſhallow Veſſels, with *Oats*, *Wheat*, *Barley*, dried *Maulr*, or ſuch like, ſome *dry*, and ſome in *water*, for them to feed on at pleaſure; and ſometimes caſt them ſome hot ſweet *Grains* on the water: By this means, in one moneth, may they be fat. *Fatting of Cignets.*

Theſe Birds are uſually kept for their Excellent Beauty and Deportment; yet they are beneficial alſo to the places where they are kept, by cleanſing them of *Snakes*, *Adders*, and ſuch-like: Their *Chickens* alſo are good meat. *Of Peacocks.*

It is a Bird of Underſtanding and Glory; for being praiſed, he elevates and ſpreads his lofty Tail; and of Pride, for no ſooner doth he behold his feet, not thinking them compleat enough for ſo painted a *Pageant*, he lets his Tail fall for meer conceit; which appears by his melancholy poſture at the loſs or ſhedding of his Tail, till Nature hath renewed it.

In any place theſe may be kept for pleaſure and variety; but in places near *London*, or ſome great City, for advantage. *Of tame Pheaſants, and the ordering of them.*

Mr. *Hartlib* hath the Relation of a Lady that kept ſo many near *Chelſey*, that ſhe hatched two hundred in one Spring; whereof that though many died, yet by far the greater part would come to perfection: Alſo, that there are many near *London* who keep them to make profit of them; that they are very eaſie to bring up, and to keep, when they are once paſt the firſt moneth; for till then they muſt be kept only with *Ants Eggs*, and fed with nothing elſe, which are eaſily obtained. The firſt moneth being paſt, they are fed with *Oats* only, requiring nothing elſe: But as they love to be kept in Graſſie Fields, ſo one muſt change them oft to freſh grounds, becauſe they taint the Graſs. Alſo the Courts may be incloſed with Laths; the Fence muſt be made high, and places of Refuge covered with Nets to keep the Hawk from them and their Chickens, which they more greedily deſire than any other Game whatſoever.

SECT.

SECT. III.

Of Inſects.

Over and above the ſtock of Cattle, Fowl, *&c.* wherewith the Country-Farm is generally repleniſhed, there are ſeveral ſorts of *Inſects*, that being judiciouſly and carefully managed and ordered, may bring into the Husbandmans-Purſe no ſmall advantage. Amongſt many of them that are uſeful in ſeveral Countries, and to ſeveral ends and purpoſes, we have only two, which are *Bees* and *Silk-worms*, that are familiarly known and preſerved amongſt us, whereof we ſhall treat apart. And firſt of *Bees*.

Of Bees.

Being ſo commonly known and kept in this Kingdom, that there is ſcarcely a Village (excepting near great Cities and Towns) where they are not kept; whereof there are many ſeveral Tracts written and publiſhed full of Rules, Precepts and Directions for the ordering, preſerving, and managing theſe profitable Creatures, both after the old and commonly known Method, and according to ſuch new ways and inventions that have been lately diſcovered and experienced, for the improvement and advancement of the Income or profit of this moſt admirable Creature: Which ſeveral ways of ordering them being ſo multifarious, and the ſeveral Tracts written on them ſo difficult to obtain, ſo intricate to be underſtood, and their Rules and Directions ſo different and uncertain, and ſubject to ſo many groſs errours and miſtakes, I hope it will be an acceptable work to the Countryman for me, in this place, to give you the moſt ſelect and approved Rules and Directions that are diſperſed in ſuch ſeveral Authors, and to diſcover unto you the many Fallacies and Deceits that ſome would lead you unto, by pretending newer and more advantagious ways of ordering them than before were known, who themſelves had never made a through Experiment of what they publiſhed; ever reſerving unto the Ingenious and Worthy *BUTLER*, the praiſe and reſpects juſtly due unto him, for his moſt Accurate and Excellent Piece on this Noble Subject; who hath as Methodically and compleatly handled this Part, as ever any Author in our Language did any other belonging to the whole *Myſtery* of *Agriculture*, or in any wiſe relating to it; yet are there many Rules, Precepts, and ways of ordering theſe curious Creatures, not mentioned in his Book, elſe had it been needleſs here to have ſaid any thing concerning them.

The praiſe and pleaſure of Bees.

There is no Creature to be kept about our Rural Seat, that affords unto us ſo much variety of pleaſure as the *Bee*.

Virgil. *In tenui labor, at tenuis non gloria:*

Although they are ſmall, yet they are numerous; and although they

they are buſied up and down on poor and mean things, yet the matter they collect is Rich and Noble: They never reſt, nor are idle, but in the extreameſt cold and wet ſeaſons. In the Spring the firſt warm Sun invites them abroad to ſeek after imployment, which they daily follow, till the bitter *Froſts*, cold and ſtiff *Winds*,

--------- *Nam pabula venti* Virgil.
Ferre domum prohibent ------

and great *Rains* hinder them. They are out early in the morning; you ſhall hear them like Swarms humming on the Line-trees by the Sun-riſing, when they ſend forth the fragrant ſcents from their bloſſoms. Alſo in the Evening late ſhall you have them return from their hard, yet pleaſant labours.

At feſſæ multa referunt ſe nocte minores, Virgil.
Crura thymo plenæ. ----

Idleneſs is ſo deteſtable a Vice amongſt them, that they will not admit of it, nor tolerate it in any (ſave their Soveraign) but every one is continually buſied either abroad in collecting their Food, or at home in building Combs, feeding their Young, or ſome other imployment.

Namque aliæ victu invigilant, & fœdere pacto, Virgil.
Exercentur agris; pars intra ſepta domorum, &c.

There are no Creatures perſiſt in that *Unity* and *Amity* one towards another in the ſame houſe or habitation, they having no ſingle propriety in any thing they do or get; for whatever they gather, all have a part; if any be injured, the other will revenge his wrongs, although to the loſs of their lives.

Their labour is not compulſive, every one acting his part voluntarily, and ſeemingly contend and endeavour to out-vie each other in their nimble and expeditious Voyages, where they ſo mightily lade themſelves, that many times their decayed Wings are not able to ſupport them home.

Sæpe etiam duris errando in cotibus alas
Attrivere, ultroque animam ſub faſce dedere
Tantus amor florum, & generandi gloria melli.

What Living Creature can you keep about you, that can yield you more pleaſure, delight and profit, than theſe that poſſeſs ſo little Room as a ſmall Partition of your Garden; that require no other houſes than what's made of Straw, unleſs you will afford them a better; that ſeek their own food throughout the Year, if judiciouſly ordered; that require ſo little trouble and attendance, as only a careful Inſpection ſome few hours in the day into

your *Apiary*, in the Moneths of *May* and *June*, and the lending unto them your aſſiſtance ſometimes in their defence againſt their Enemies, and to help them in their neceſſities, in the Winter-time and bad Weather, when they cannot help themſelves; and that yield ſo conſiderable an Yearly Reward unto you for all your care, pains and induſtry about them.

There can be nothing kept more advantagious than an *Apiary*, according to the ſtock or ſum you lay out. Many a Countryman hath raiſed a ſufficient livelihood only from theſe laborious Creatures: We need produce no Preſident for it; it is ſo uſual, *Virgil* alſo ſeems to hint as much, where he ſaith:

Corycium vidiſſe ſenem; cui pauca relicti
Jugera ruris erant. Nec fertilis illa juvencis,
Nec pecori opportuna ſeges, nec comoda Baccho,
Regum æquabat opes animis; ſeraque revertens
Nocte domum, dapibus menſas, onerabat inemptis.
----- Apibus fœtis idem, atque examine multo,
Primus abundare.

But many are ready to object, that they will not thrive in this or that place, or with this or that perſon; and that ſometimes they thrive a Year or two, and no more, with many other ſuchlike conceits; which if rightly conſidered, it is only the ignorance, ſlothfulneſs, or wilful neglect of the Keeper or Maſter of them that occaſions theſe miſhaps: And I queſtion not, but if the due and orderly Rules hereafter mentioned be obſerved, but that they will equally thrive at all ſeaſonable times, and with all perſons, the places and other accidents conſidered.

Virgil. *Principio ſedes Apibus, ſtatioquæ petenda.*

Of the Apiary. A convenient and neceſſary place is to be made choice of for your *Apiary*: It is uſual for thoſe that have but few, to place them in any corner of their Garden, or in their Courts or Backſides, and ſome in the Cloſes adjoyning to their houſes, others for want of convenient room without doors, have ſet them in the Lofts or upper Rooms of their houſes, and in all or any of theſe places will this laborious Creature live; but not with that content, nor to that advantage of the *Bee-Maſter*, as if more propitiouſly diſpoſed of; for either they have not ſufficient of the Sun wherein they principally delight, and which inables them for their imployment, or they are too much open to the Windes, which is a great hinderance to them in their return when laden, or they are ſubject to Annoyances, incident to ſuch cloſe corners and inconvenient places; which is a principal cauſe of their not thriving ſo well as otherwiſe they might do, if better placed.

Form and manner of the Apiary. Therefore where it is in your Election what place to have, and intend to poſſeſs your ſelf of a conſiderable ſtock of *Bees*, make a ſquare Plat, and ſever and divide it by its ſelf, of capacity anſwerable

ſwerable to the ſtock you intend to raiſe; but rather bigger than leſs, and rather long (extending from *Eaſt* to *Weſt*) than ſquare, facing to the *South*; rather inclining to the *Weſt* than *Eaſt*, becauſe of the *Bees* late returning home, that they may not then want light: But ſome are of another Opinion, that it's beſt to let them have the firſt Sun in the morning, that they may go early abroad, that being the moſt apt time for the gathering of honey: Alſo I have known *Bees* thrive very well having the firſt riſe of the Sun at their doors; and others not to thrive, being detained ſome hours from it by ſhadowy Trees, and in another place by a Wall; but the ſureſt way is to let them have as much of both Morning and Evening Sun, as the places and fences will give way to.

You may be ſure that the Morning-Sun makes them ſwarm early in the day, elſe they will ſwarm late.

Let it be ſecurely defended from high windes on every ſide, either Naturally by Hills, Trees, *&c.* or Artificially by Houſes, Barns, Walls, Pales, Hedges, *&c.* and let the higheſt Fences be on the *North*; the other ſhould be but low, or far diſtant, leſt it hinder the Sun, and alſo their flight: Alſo let there be no ill ſmells or ſavours near it, nor that Poultry frequent the place.

Let the ground of your *Apiary* be kept Mown, not digged nor pared, becauſe it is too hot in the Summer, and too cold in the Winter.

It is alſo very convenient to plant ſeveral Trees at ſome reaſonable diſtance from your *Bees*, as *Plum-trees*, *Cherry-trees*, *Apple-trees*, *Filberts*, *Hazels*, *Thorns*, *&c.* that they may pitch at Swarming-time near at home, and not be in danger of being loſt for want of a lighting place; for want whereof you may ſtick up green Boughs, and the *Bees* will pitch upon them.

Alſo let not your *Apiary* be very far from your home, that you may be often with them at Swarming-time, and on ſeveral other occaſions.

Of the Seats or Stools for Bees.

The common and uſual way is either *Stools* or *Benches*; *Stools* are uſed by moſt, and eſteemed the better of the two, ſome whereof are of Wood, and ſome of Stone; the Wood are eſteemed the better, the Stone being ſo hot in the Summer, and cold in the Winter. Theſe *Stools* alſo are placed at different heights, ſome on the ground, others mounted aloft two foot high; but *in medio virtus*, about twelve inches is an indifferent height, and ſet a little ſhelving, that the Rain may run off. Theſe *Stools* alſo ought to be two or three inches wider than the *Hives* you place upon them, with a place before a little broader for the *Bees* to light on.

Theſe Stools ought to ſtand at leaſt five foot the one from the other, meaſuring from the middle of each other Stool, in ſtreight Ranks from *Eaſt* to *Weſt*; which Ranks, if you place them one behinde another, had need be ſix or eight foot aſunder, and the Stools of the one Rank placed againſt the open places or inter-

vals of the other: Place them not near the Fences on neither ſide, nor before, for hindering their flight.

Of Benches. *Benches* are alſo uſed by many; ſome I have ſeen placed the one above the other, and on each a Row of Stocks of *Bees*; which although they may poſſibly thrive, yet is not in any wiſe convenient; for *Benches* cannot be thought neceſſary, unleſs you place the *Hives* near together, which produces many inconveniencies. Alſo one cannot ſo eaſily come at them, to trim, dreſs, or order them, where they ſtand ſo near, or on Benches, as where they ſtand ſingly, or apart.

The beſt Seat. But if you intend to go through-ſtitch with the work, and make a compleat *Apiary* worthy of your care and pains, and wherein you intend to place a part of your delight, you may make for every Stock of Bees you intend to keep, a ſquare Cot or Houſe of about two foot ſquare, and two foot and a half in height, ſet on four Legs about ten inches above ground, and five or ſix inches within the ground, and covered over with Boards or Tiles to caſt off the Rain, the back or *North-ſide* being cloſed up, and the Sides reſpecting the *Eaſt* and *Weſt* to have doors to open and ſhut at pleaſure, with Latches or Haſps to them, the face or *South-ſide* to have a Falling-door to cover the one half thereof, which is to be elevated at pleaſure, and ſerves in the Summer-time for a *Pent-houſe*, not only to keep off the beating Rain from the Hives, but to defend them from the extream heat of the Sun, which about the Mid-day is apt to melt their Honey. The other lower half ſhould have two ſmall doors to open to either hand, which will ſerve to defend the doors or the holes of the Hives from injurious Windes. When the *Winter* approacheth, and the cold Windes are like to injure your Bees, then may you faſten all your doors; which will as well defend your Bees from the extremity of Cold in the *Winter*, as extremity of Heat in the *Summer*; both injurious to this Innocent and induſtrious Creature.

Virgil. ------- *Nam frigore mella*
Cogit hyems, eademque Calor liquefacta remittit
Vtraque vis Apibus pariter metuenda. ----

You may remember at the bottom of your little doors, to make an open ſquare place juſt againſt the *Tee-hole*, that the Bees may have ſome liberty (after you have ſhut the doors) to fly abroad.

Here needs no Hackle to defend the *Hive* from Rain, nor is there any fear of wet or winde to annoy them. Here may you place any ſort of Hives, whether of Straw, Boards, Glaſs, or any other thing whatſoever, without any ſudden decay or loſs by the injuries of Weather, which by placing them abroad they are ſubject unto: By the means of the Side-doors, eſpecially if you make the *Weſt-door* to open to the right hand, may you ſit ſecure, and obſerve the ſeveral workings of the Bees in your

Glaſs-

Glaſs-Hives, if you are pleaſed to make uſe of them; but if not, you may at theſe places order, view, and obſerve them, better than when they ſtand on naked Stools, and with leſs offence to the Bees, and more ſecurity to your ſelf.

In the Winter-time if your *Apiary* ſtand cold, and you fear the extremity of Froſt may injure your Bees, you may within theſe doors ſtuff good ſweet Straw about your Hive, to keep the Bees the warmer.

But extremity of cold injureth not the Bees ſo much in the Winter, as wet, which theſe Caſes beſt preſerves them from; or as Light, and the warm Beams of the Sun, at ſuch time when there is no proviſion abroad for them, againſt which this Houſe or Cot is a moſt certain Preſervative; for when the doors are ſhut in ſuch Moneths you are not willing they ſhould fly abroad, although the Sun ſhine, yet they are dark, and unſenſible of ſo ſmall a heat, the Hive ſtanding ſix or eight inches within the doors; when after the common way of Stools or Benches, the Sun caſts his Rays to their very doors; which warmth and light together excite them forth, to the expence of their proviſion, and the loſs of many of their Hives, as is evident by frequent experience, the mildeſt and cleareſt Winters ſtarving and deſtroying the moſt Bees; and on the contrary, the coldeſt and moſt frozen Winters beſt preſerves them. It is alſo more plainly manifeſt, that in the *Northern Regions*, as *Ruſſia*, *Muſcovia*, *&c.* Bees do much more abound in the Woods than in theſe parts, their Winters being ſo dark and ſo cold, which by this way may in ſome meaſure be imitated.

In the Spring-time alſo there are ſeveral days that are not fit for the Bees to be abroad in; at ſuch times may you keep the doors ſhut, leaving only the under-paſſage open, where ſuch that liſt may take the Air, though by far the greater part lye ſtill unſenſible that the *Spring* is ſo near. But when you ſee the Weather is good, and that the *Willow* or *Withy* yields them imployment, you may ſet open your two under-doors, that the warmth and light of the *Sun* and *Air* may encourage them to work, otherwiſe you will hinder their early breeding, and make them ſlothful; for I have had the experience, that by ſetting an *empty Hive* before a *full*, expecting that by the continual paſſing of the Bees to and fro through that empty Hive, they might ſtock it, that ſo I might have had two Stocks for one without Swarming; but it framed not according to expectation, the Bees in the inner Hive being ſo far removed from the light and Air became lazy, and did not encreaſe nor labour ſo well as thoſe that were otherwiſe ordered; therefore open your doors in time, but not too early, for fear of the other extream; we can give you no certain time for it, becauſe the Springs vary ſometimes two or three Weeks.

Several ſorts of Hives are uſed in ſeveral Countries, but here in *England* they generally make uſe of two ſorts, either *Wicker-Hives* made with Spleets of Wood, and daubed with *Cow-* *Of the Hives.*

dung

cloom tempered for that purpoſe, or *Strawn-Hives* made of good Wheaten-ſtraw bound with Bramble, which are the beſt and moſt uſual that are yet common.

The *Wicker-Hives* are ſtill at fault, the Loom mouldering away upon every occaſion; which is not in any wiſe good for the *Bees*, who love not to have any Vents open but their doors.

The form and bigneſs of the Hives.

There is great diverſity of Opinion amongſt Authors, concerning the bigneſs and form of the Hive; ſome preferring the high and narrow Hive, of three foot in height, and one in breadth, or of two foot broad, and two foot high, neither of which can be convenient: but that form which is moſt round, and in quantity about half a Buſhel and upwards, is moſt in uſe, and is eſteemed the beſt way, and fitteſt ſize for your purpoſe: ſome you may have under half a Buſhel for ſmall *Swarms*.

Dreſſing the Hives.

Before you put any Swarm into a new Hive, you muſt make the in-ſide as ſmooth as may be, from the ends of Sticks and Straws, which much trouble the *Bees*, who ſpend much of their time in gnawing them off; as in the night-time you may obſerve in a few days after the Hiving. After that you have picked out the greateſt Sticks and Straws, then rub the in-ſide over with a *Sand-ſtone*, and then ſinge it with a little flame of Straw, and wipe it clean.

Of Wooden-Hives.

Hives may be made of Boards, either of an eight-ſquare form joyned together, or round with Hoops, like a Milking-pail, flat on the top. In theſe *Hives*, if they are made of Wood that hath no unſavoury ſcent or taſte, as Deal, Beech, or ſuchlike, the *Bees* will delight and breed as well as in either of the other, and they will laſt many years, and are freer from the injuries of the Weather, and ſeveral other caſualties the other are ſubject unto, provided they are made with dry ſeaſoned Wood that is not apt to ſhrink.

Of Glaſſen-Hives.

In theſe *Hives* of *Wood* may be made ſeveral *Glaſs-windows*, at what height or diſtance you pleaſe, not only for your obſervation of their work, which you may with much facility and delight perceive how far they proceed, and in what time, but that the *Bees* alſo may have the more light; a principal help and incouragement in their labours.

To every of theſe Windows of Glaſs you ought to have a ſmall and light Shutter of Wood to hapſe on the out-ſide of the Glaſs in cold weather, and at ſuch times as the Sun ſhines on that part of the *Hive*, it being ſubject to both extreams of heat and cold; yet ſo as you may take them down at your pleaſure for your inſpection, and leave ſuch always down during the Summer that are from the Sun-wards.

We have alſo an Experiment of *Glaſſen-Hives*, publiſhed by Mr. *Hartlib* in his *Commonwealth of Bees*; as invented by one Mr. *William Mew*, Miniſter at *Eaſlington* in *Gloceſterſhire*, and thus written:

The Invention is a fancy that ſuits with the Nature of that Creature; they are much taken with their Grandeur, *and double*

their

their Tasks with delight : I took (saith he) *fourteen Quarts out of one of the Transparent* Hives, *double their quantity of others, they quickly paid me the Charges with their Profit, and doubled it with pleasure.* And in another place thus:

They serve only to give me an account of the daily Income, and a Diary of their Negotiations; whereby if I spend (saith he) *half an hour after Dinner or Supper, I know what hath been done that day; can shew my Friends the* Queens Cells, *and sometimes her Person, with her Retinue. She afforded me fourteen Quarts, or near upon, in one year; and if the rest afford ten a piece, I think it a fair gain. There is not a* Hive *to be seen about my House, nor a Childe stung in a year: My* Apiary *consists of a Row of little Houses two Stories high, two foot apart, which I finde as cheap at seven years end as* Straw-Hackles, *and far more handsome.* Thus far Mr. *Mew.*

We also in the same Book finde the description of a *Bee-hive* made of boards of an *Octogonal* form, with a Glass-window on the back-side of it, for the observation of their work; the rest of the in-side of the *Hive* lined with Mat made of Rushes: Three of these were set one on the other, with open passages between each of them, which produced these effects: *Viz.*

In *May* (saith the Relater) we put in two Swarms together, leaving the places to go in open only in the lowermost, but all the Passage-holes open from Box to Box: In the middlemost they first began their Combs, then in the lowermost, before they had filled the middlemost, and so continued till they had filled both; which before they had quite finished, they began to make two little Combs in the upper-Box, *&c.*

The Combs in the lower stories were well repleniſhed with Honey, and suddenly; but these little Combs in the upper, they quite desert. *Thus far that Relation.*

These are the several Descriptions and Forms of *Bee-hives* we have met withal published; but it is reported, that there are several other Forms and Fashions made, and that with very good success, as well for the advantage of the *Bees*, as pleasure of the *Bee-Master*, by several worthy and ingenious persons. It would be very much for their Credit and Reputation, and exceeding satisfactory to others, if such their Inventions and Observations were made publick.

As for my own particular, I have made many and difficult Experiments and Essays towards the advancement of the profit and pleasure of this Industrious Animal, and have made use of most of the former sorts of *Bee-hives*, and framed several others, with Remedies and Provisions for such inconveniences and omissions I found in the other; and have with as much Caution observed the Operations and Nature of *Bees* throughout the whole year, as my Occasions would give way to, and my shallow Capacity could apprehend; as you may finde by the sequel of the *Tract*: Yet have I not finished to attain the right Method, or way of ordering them, as I principally aim at. The two unsea-

sonable

ſonable years for Bees, 1665, and 1667; and my preſent Removal preventing the greateſt part of my deſigne: It alſo being the work of a year, or at leaſt that part of time that comes but once a year, to make one Experiment or Obſervation. And the Obſervations already publiſhed, which ought to be a Guide, prove rather an *Ignis Fatuus*, to lead one out of the way, than an *Index* to point out the truth; as we ſhall hereafter in this Book make appear.

Nevertheleſs, this Obſervation I have found to be true; *viz.* that Bees delight not in an high habitation; the broader and flatter it is, the better they proſper; for they cannot with eaſe paſs up through the intervals of their Combs to the Summit of their Hives: Therefore if you mean to make a Hive wherein they ſhould delight, let it not be very high, but allow it as much in breadth as you pleaſe, they will be ſure to fill it.

Of Spleeting of the Hives.

But before we have done with the *Hives*, we muſt not forget the *Spleeting* of them. The way they uſually Spleet the ordinary ſtrawn and daubed *Hives*, every *Country Coridon* underſtands. As for our *Wooden* or *Glaſs-Hives*, ſome preſcribe that there be three down-right Sticks from the top to the bottom, and about two ſmall Hoops faſtened unto them at convenient diſtances, which will very well ſerve for the faſtening and ſupporting of the Combs, which way I have uſed: it's beſt to let the perpendicular ſticks extend to the bottom, for the Bees the better to crawl up by them to the Combs; but you may have only down-right ſticks, or any other ways placed, as beſt agrees with the form of your Hive, ſo that there be not too wide intervals between.

Of the ſwarming of Bees.

Having prepared ſuch Hives you deſigne to make uſe of, the only way to ſtock them is by putting Swarms into them; notwithſtanding I have many times attempted to intice, and inforce them without Swarming (confiding too much on the Writings and Reports of other men) out of their own old habitations, into my new Hives.

Several Experiments to encreaſe Bees without ſwarming.

The one way I uſed was this; I ſet an empty Hive before a full, that the Bees paſſing from their old through the new and empty Hive, might chuſe rather to live therein, than go forth in Swarms to ſeek another: but the long and darkſom paſſage, being of Strawn-Hives, made the Bees lazy (as before we noted) together with the unſeaſonableneſs of that year, that the Bees did not breed any more than to maintain their old ſtock; ſo that my deſigne became fruitleſs.

Then preſuming on that Principle, that the Bees always begin their work above, and ſo work downwards, I took an old Stall of Bees, and long before Breeding-time inverted the ſame, with the ſkirts upwards, and the tops downwards, in an hollow ſtool made for that purpoſe, and placed thereon one of my new wooden Hives, with Glaſs-windows thereto, having a bottom which covered the whole under-Hive, ſave only a wide hole in the middle, through which the whole Stock of Bees had their

paſſage

paſſage in my new Hive; and ſo out at the door of my new Hive they continually paſſed to and fro. In the Summer-time, when the under-Hive was over-full, they took to the top of the new Hive, and built there ſome few *Combs*; which before Winter, when their number leſſened, and the under-Hive was able to contain them all, they deſerted; and did not, according to my expectation, forſake their old Stock, and take altogether to the new, although the ſame were above them, and the old one under them: But in all probability I had had a greater number of Combs, and a greater ſtock of *Bees*, and they alſo would have continued longer; which would much have elucidated this Experiment, had it not fallen out to be in ſuch a year that few Stocks yielded any Swarms.

Another way I made uſe of was this: thinking the *Bees* would leave no place above them uninhabited, I cut off the top of a *Strawn-hive*, until I had made a paſſage through the top of the Combs, and thereon I placed one of my *Glaſſen-hives*, with a bottom, and a hole in the midſt thereof, through which I uſed all the means I could to provoke the Bees to paſs, but in no wiſe would they; for as ſoon as they were in the upper, though light by means of the Glaſs, yet they immediately returned.

Alſo I placed ſeveral Stocks in *Strawn-hives* on *Wooden-hives* with *Glaſs-windows*, and left convenient paſſage out of the one into the other, with a Cover alſo to the hole that paſſed between the two *Hives*, which I might move at pleaſure. I alſo ſtopped the doors of the *Strawn-hive*, that they had no other paſſage than through the *Wooden-hive*, wherein at Swarming-time they built many large *Combs*, and ſtored them well with *Honey* (it being a good Year for breeding of *Bees* wherein I made this Experiment) but when the cold Weather came, and the number of *Bees* began to leſſen, which they always do againſt the Winter, they crowded all up into the upper *Hives*, carried up or ſpent the *Honey* in the new *Combs*, and deſerted them, leaving them as an empty Spectacle through the *Glaſs-windows*.

The one of theſe *Stocks* about Swarming-time having a good quantity of *Bees* in the under *Glaſs-hive*, I ſhut the paſſage between the upper and lower *Hive* with the Shutter made for that purpoſe, and took away the upper Stock, and ſet in another place, thinking thereby to have two Stocks for one (the *Bees* being as equally divided as might be) yet the *Bees* in the *under-hive* having loſt their old paſſage, or not having their *King* or *Queen*, or for ſome cauſe or other, did not like their habitation very well, but in two or three days were moſt of them gone into their old Hive, or loſt; which compelled me (for further tryal-ſake) to place the one over the other, as before; then they fell again to their buſineſs: So that by any way hitherto Eſſayed, I cannot diſcover how to encreaſe my Stocks, as to number, without giving them leave to Swarm, or go forth in Companies from their own homes (as it were) with their Prince or Leader to ſeek a new habitation.

But having thus far ſpent much time and labour to underſtand the Nature of theſe wonderful and induſtrious Creatures, and finding theſe Attempts not to anſwer my expectation, I was unwilling to deſiſt; the Errours of one, uſually leading to the diſcovery of another and better Experiment: but began a new way, and more probable than the other; which is, in every *Bee-hive* of Wood with *Glaſs-windows* I had a large Pipe of about two inches ſquare in the clear, that came from the top of my Hive to the bottom, open at both ends: at the bottom it was cut on the four ſides Arch-wiſe, that the *Bees* might on every ſide aſcend freely up the Pipe. I fitted a piece of Wood into this Pipe, to prevent the *Bees* from making any *Combs* therein, until ſuch time as the Swarm put in it ſhould fill the Hive: then would I place another of the ſame ſort and faſhioned Hives on the top thereof, with his door open alſo, (having firſt taken out the Stoppel fitted to the Pipe) that the *Bees* from the bottom of their own work might aſcend through that Pipe into the newly placed *Hive*; which way when they had once diſcovered, doubtleſs they would rather take to, than ſwarm: by which means it is moſt probable you may multiply your Stocks, by placing Hive upon Hive *ad infinitum*, and drive your Bees, *&c.* which I had throughly proved, had not my Removal prevented me; that I can promiſe you no aſſurance of the effect, but hope to give a better account thereof in a few years; diſcovering thus far of what I have ſeen and made experience of, that you might avoid thoſe difficulties and errours I met withal, and proceed on ſuch ways that ſucceeded well, and are in probability to anſwer what your deſire is.

The bigneſs of Swarms or Stocks of Bees.

Where your deſigne is for multiplication of your Stocks, there it's beſt to make your Hives the ſmaller; and where you aim at great quantities of Honey, there make them the greater: So that in caſe you cannot prevail in the one, it may nevertheleſs be a conſiderable and ſure advantage in the other; as is evident in Mr. *Mew*'s Experiment of his *Tranſparent Hive*, out of one of which he took fourteen quarts of Honey; then it's very probable the Hive held twice as much, for the Wax, Bees, and vacant places: ſo that his Hive was of an extraordinary bigneſs, and yielded an extraordinary advantage.

Alſo in the other before-mentioned Experiment, the *Octogonal* Boxes or Hives are of a very great bigneſs, at leaſt two foot wide, and of about fifteen inches deep, into which they put two Swarms together, which filled two of them in the firſt Summer.

Alſo in the Hiſtory (*Butler* mentions in his *Feminine Monarchy*) of the *Bees* that ſetled over *Vives* his Study, having ſo much room, what an incredible Maſs of Honey was there produced?

Therefore we cannot but urge this as a part of good Husbandry, to have a Set of well-made Hives tranſparent, or with lights of a good capacity, or to be added the one above the other,

as

as we ſaid before; although it be only for the encreaſe of Honey, and another Set of ſmaller *Hives* only for the encreaſe of Swarms; for a few *Hives* in a thriving condition, and well ordered, will yield you *Bees* enough to ſtock many of your larger *Hives*.

If the Spring be milde, calm and ſhowring, then is it good for Swarms, and they will be the earlier; but if it prove a cold, dry and windy Spring, ſuch as were 1665 and 1667, then will there be but few Swarms that year, and thoſe alſo very backward. *Signes of Swarming.*

About the middle of *May*, in an early Spring, you muſt begin to look after them, and obſerve what you can of the uſual ſigns that precede their ſwarming, that you may be the more watchful over thoſe that require it when the *Hives* are full (before which they will never ſwarm) they will caſt out their Drones, yea, although they be not quite grown. Secondly, the *Bees* will hover about the doors in cold Evenings and Mornings. Thirdly, there will be moiſtneſs and ſweating upon the Stool. Fourthly, they run haſtily up and down. Fifthly, they lie out in ſultry Evenings and Mornings, and go in again when the Air is clear.

If the Weather be warm and calm, the *Bees* delight to riſe, but eſpecially in a hot Gleam, after a ſhowre or gloomy Cloud hath ſent them home together; then ſometimes they gather together without at the door, not only upon the Hive, but upon the Stool alſo; where when you ſee them begin to hang in Swarming-time, and not before, then be ſure they will preſently riſe if the Weather hold. *Signes of preſent Swarming.*

To lie forth continually under the Stool, or behinde the Hive, *&c.* eſpecially towards the middle of *June*, is a ſigne or cauſe of not ſwarming: for when they have once taken to lie forth, the Hive will always ſeem empty, as though they wanted company; then will they have no minde to ſwarm. *Signes and cauſes of not Swarming.*

Alſo much ſtormy and windy Weather will not ſuffer them to Swarm when they are ready, and that makes them lie out; and the longer they lie out, the more unwilling they are to Swarm.

Another cauſe of their lying forth, is continual hot and dry Weather, eſpecially after the *Solſtice*; which cauſing plenty of honey both in Plants and Dews, their minds are ſo ſet upon that their chief delight, that they have no leiſure to ſwarm, although they might moſt ſafely come abroad in ſuch Weather.

Firſt keep the *Hive* as cool as may be, by watering and ſhadowing both it and the place where it ſtandeth; and then inlarging the door to give them Air, move the Cluſter gently with your Bruſh, and drive them in. *To make them Swarm.*

If yet they lie forth and ſwarm not, then the next calm and warm day about Noon, whileſt the *Sun* ſhineth, put in the better part with your Bruſh, and the reſt gently ſweep away from the Stool, not ſuffering them to Cluſter again: Theſe riſing in

the calm heat of the *Sun*, by their noiſe, as though they were Swarming, will make the other to come forth perhaps unto them, and ſo they may ſwarm.

If this ſerve not, but they lie forth ſtill, then rear the *Hive* enough to let them in, and cloom up the ſkirts all but the door: If this ſucceed not, there is no remedy.

Signes of after-Swarms. The ſigns of *After-ſwarms* are more certain: when the *Prime-ſwarm* is gone, about the eighth or tenth Evening after, when another Brood is ready, and again hath over-filled the *Hive*, the next *Prince* beginneth to Tune in her Treble Voice, a mournful and begging note; then in a day or two ſhall you hear the old *Queen* in her *baſe Note* reply, and as it were conſent. In the Morning before they ſwarm, they come down near the Stool, and there they call ſomewhat longer. At the very time of *Swarming* they deſcend to the Stool, where anſwering one another in more earneſt manner, with thicker and ſhriller Notes, the multitude come forth in great haſte, *&c.*

If the prime Swarm be broken, the ſecond will both call and ſwarm the ſooner, it may be the next day, and after that a third, and ſometimes a fourth; but all uſually within a fortnight: ſometimes alſo a Swarm will caſt another that year.

Ringing of Bees. When the ſwarm is riſen, it is the uſual cuſtom to play them a Fit of Mirth upon a Pan, Kettle, Baſon, or ſuchlike Inſtrument, upon pretence to gather them together, and make them ſettle; which Cuſtom ſeems to be very Ancient, as *Virgil* witneſſeth.

Tinnituſque cie, & matris quate Cymbala circum, &c.

And notwithſtanding this hath been accounted and found to be needleſs, yet by *Levet* in his Treatiſe of *Bees* it is eſteemed as a ridiculous Toy, and moſt abſurd Invention, and rather hurtful than profitable, becauſe all great noiſe doth diſquiet and hurt them; he ſaith he had above forty Swarms in a Year, without the loſs of one; when his Neighbours having a far leſs number, and uſing this kinde of Jugling, loſt divers. Alſo *Butler* makes no other uſe of it, than where there be many *Apiaries* near, publickly to notifie the time and place of their riſing, that ſo a juſt and open Claim may be laid unto the Swarm; eſteeming the pretended reaſon of ſtaying the Swarm to be a meer fancy.

But if they fly aloft, or are like to be gone, caſt duſt amongſt them to make them come down.

Hiving of Bees. When your Swarm hath made choice of a lighting place, you ſhall quickly ſee them knit together, in form of a *Cone*, *Pine-apple*, or Cluſter of *Grapes*: when they are fully ſetled, and the *Cone* hath been a while at the biggeſt, then *Hive* them.

Firſt (having in ſtore ſeveral *Hives* of ſeveral bigneſſes) make choice of a *Hive* proportionable in bigneſs to your Swarm, that the *Bees* may go near to fill it that year; but rather under-Hive a Swarm than over-Hive them.

Then

Then rub the *Hive* with ſweet Herbs, as *Thyme*, *Savory*, *Marjerom*, *Baulm*, *Fennel*, *Hyſop*, *Mallows*, or *Bean-tops*, *&c.* and with a branch of *Haſel*, *Oak*, *Willom*, or any other of the aforeſaid Herbs, but rather of the ſame Tree whereon the Swarm lighted, wipe the *Hive* clean, and dip ſuch Sprig or Branch into *Meath*, or fair water mixed with a little *Honey*, or with *Milk* and *Salt*, or *Salt* only, and therewith beſprinkle the Hive.

Then having firſt drank a Cup of good *Beer*, and waſhed your hands and face therewith, or being otherwiſe defended, if the *Bees* hang upon a bough, ſhake them into the *Hive*, and ſet the ſame upon a Mantle or Cloth on the ground, as is uſual; or you may cut off the bough if it be ſmall, and lay it on the Mantle or Cloth, and ſet the Hive over it, which is the better way.

If they light near the ground, lay your Cloth under them, and ſhake them down, and place the *Hive* over them; and ſuch *Bees* that gather together without the *Hive*, wipe them gently with your Bruſh towards the *Hive*; and if they take to any other place than the *Hive*, wipe them off gently with your Bruſh, and rub the place with *Mugwort*, *Morgan*, *Wormwood*, *Archangel*, or other bitter or noyſome Weeds or Herbs.

Then ſet the Swarm, as near as you can, to the lighting place, till all be quiet, and every one knows his own home.

If the Swarm part and light in ſight one of another, let alone the greater, and diſturb the leſſer part, and they will fly to their Fellows; but if not in ſight, then *Hive* them both in two ſeveral *Hives*, and bring them together, and ſhake the *Bees* out of the one *Hive*, on the *Mantle* whereon the other *Hive* ſtands, and place the other full *Hive* on them, and they will all take to it.

If it happen that your *Swarms* come late, after the middle of *June*, and that they are ſmall, under the quantity of a Peck, then put two or three of them together, whether they riſe the ſame day, or in divers: for by this uniting they will labour carefully, gather ſtore of wealth, and ſtoutly defend themſelves againſt all Enemies. The manner of uniting is thus. *Uniting of Swarms.*

In the Evening when it waxeth dark, having ſpread a *Mantle* on the ground near unto the Stool where this united Swarm ſhall ſtand, and ſet a pair of *Reſts*, or two Supporters for the *Hives*: knock down the *Hive* out of which you intend to remove your *Bees* upon the Reſts; then lifting up the *Hive* a little, and clapping it between your hands to get out the *Bees* that ſtick in it, lay it down ſide-ways by the *Bees*, and ſet the Stock or *Swarm* to which you would add them upon the Reſts or Supporters over them, and they will forthwith aſcend into the *Hive*; thoſe that remain in the empty *Hive*, by clapping it, will haſten after their company: then when you have gotten them all in, either that night, or early in the next Morning, place the *Hive* on the Stool, *&c.*

Place the *Hive* wherein you have newly put your *Swarm* you intend to drive into another, in a place that the ſkirts may be uppermoſt, *A better way.*

uppermoſt, and ſet the other upon him, binding them about the ſkirts with a long Towel; and ſo let them ſtand till the Morning, and the *Bees* will all aſcend, that you may the next Morning ſet the *Receiver* on a Stool: And thus may you put three or four Swarms together; but obſerve to unite them the ſame Evening, or the next at fartheſt, that they *ſwarm*; leſt having made *Combs*, they are the more unwilling to part from them.

Defence againſt Bees. In theſe ſeveral ways of dealing with *Bees*, it is good to defend ones ſelf as well as may be againſt their ſtinging, which to ſome perſons proves very troubleſome, eſpecially if they are uncleanly, or have any ill ſcent about them; therefore with caution muſt they be tampered withal. Some only drink a Cup of good Beer, and finde that ſufficient; others waſh their hands and face therewith, which proves a good defence: I have gone amongſt them in their greateſt anger and madneſs, only with a handful of ſweet herbs in my hand, fanning about my face, as it were, to obſcure and defend it. Alſo if a *Bee* do by accident buz about you, being unprovided, thruſt your face amongſt a parcel of boughs or herbs, and he will deſert you. But the moſt ſecure way of all, and beyond the compleateſt *Harneſs* yet publiſhed, is to have a *Net* knit with ſo ſmall Meſhes, that a *Bee* cannot paſs through, and of fine Thred or Silk, large enough to come over your Hat, and to lie down to the Coller of your Doublet, through which you may perfectly ſee what you do without any danger, having alſo on a good pair of Gloves, whereof Woollen are the beſt.

To cure the ſting of a Bee. But if the *Bee* happen to catch you unawares, pull out the ſting as ſoon as you can. Some preſcribe to waſh the ſame with your Spittle, and ſay that that will prevent ſwelling: Others commend the rubbing thereon the Leaves of *Marigolds*, *Houſeleek*, *Rue*, *Mallows*, *Ivy*, *Holyhock* and *Vinegar*, *Salt* and *Vinegar*, and divers other things: But the moſt ſure and Natural Remedy, is to heat a piece of Iron in the fire, or for want of that to take a live Coal, and hold it as near and as long to the place as you can poſſibly endure it, which will Sympathetically attract the fiery venom that by the ſting was left in the wound, or force it out of the place affected, and give you an immediate eaſe and cure. The ſame it will effect on the bitings or ſtingings of Snakes, or other venomous Creatures; and it's probable, on the bitings of mad Dogs: But of this in another place.

Of the Bees work. As ſoon as a Swarm hath entered his *Hive*, they immediately (if the Weather permit) gather Wax and build *Combs*, that in a few days time there will be ſeveral large and compleat *Combs*; they lie ſo thick about them, that it's impoſſible one quarter of them can be imployed at once, until the *Combs* are brought to a conſiderable length; and then a great part of them may be imployed in filling them, the reſt in finiſhing their *Cells* or *Combs*.

It's a difficult matter in our *tranſparent Hives*, to diſcern how theſe Admirable Creatures frame their curious Workmanſhip,

ſhip, by reaſon they are ſo numerous, that they generally cover their whole Work, that unleſs the Bees alſo were tranſparent (as *Butler* terms it) it cannot be diſcerned: But through the Glaſs you may obſerve how they carry up their far-fetcht goods, and what a mighty ſtir they make, and how perpetually buſie they are, and in a clear day when moſt are abroad, eſpecially towards the end of the Summer: Alſo when their Young Bees are fit for ſervice, and are abroad, which are thoſe chiefly that hide ſo much of the Combs; then may you plainly diſcern their *Combs* and *Cells* filled with bright and clear *Honey*.

Their numbers alſo, towards the end of the Summer, begin to leſſen, which gives you a great advantage of beholding them and their work: For in their proſperity at Swarming-time, and ſhortly after, they are far more in number than in the *Autumn* or *Winter*; as you may eaſily diſcern between the quantity and number of a *Swarm*, and thoſe you kill when you take them; for the *Bees* of the laſt years breed do now by degrees waſte and periſh; by their extraordinary labour, their Wings decay and fail them: ſo that a Year, with ſome advantage, is the uſual Age of a *Bee*, and the young only of the laſt Spring ſurvive and preſerve the kinde till the next. *The numbers of Bees.*

There are ſeveral things that are injurious to *Bees*, and much hinder their proſperity, if not prevented. *Of the Bees Enemies.*

1. *Noiſe*, which may in part be remedied by the ſcituation of the *Apiary*, free from the *Noiſes* of Carts and Coaches, the ſound of *Bells*, from *Ecchoes*, &c.

2. *Smoak*; I have known that when Land hath been *burn-beaten*, near unto an *Apiary*, and the Winde brought the Smoak towards it, that a great part of the Bees intercepted by the Smoak in their flight, have been deſtroyed; which is a principal cauſe that Bees thrive not in or near a great Town.

3. *Ill Smells* alſo are very offenſive to them, as before we noted.

4. *Ill Weather*; as *Windes*, *Rain*, *Cold*, *Heat*, *&c.* prevented by the ſcituation and fencing the *Apiary*, and ordering the *Stocks* as before.

5. The *Mouſe*, *Birds*, and other devouring Creatures; which are to be deſtroyed, as hereafter we ſhall ſhew you.

6. Noyſome Creatures; as *Toads*, *Frogs*, *Snails*, *Spiders*, *Moths*, &c. which you muſt endeavour to keep out of your *Apiary*; and alſo cleanſe your *Hives* ever and anon from theſe Vermine.

7. *Hornets* and *Waſps*, in ſuch years wherein they abound, prove great Enemies to the Bees, by robbing them of their wealth; which are deſtroyed by placing near the door of the Hive a Glaſs-Vial half full of *Cider*, *Verjuice*, ſowre drink, or ſuchlike, wherein they go and never return.

8. Bees themſelves prove the greateſt Enemies, both by fighting and robbing. Several occaſions provoke the Bees to fight; which if the Battle be but newly begun, may be hindred by ſtopping

ſtopping up the Hive cloſe where they begin to fight; or if it be ſo far gone that moſt of the Bees are out, and that the Conflict is very great, the caſting up of duſt amongſt them was the ancient way to pacifie them, as *Virgil* witneſſeth:

Hi motus animorum, atque hæc certamina tanta
Pulveris exigui jactu compreſſa quieſcent.

But *Butler* condemns this Cuſtom; and alſo of caſting drink amongſt them.

To keep and preſerve your Bees from Robbers, which are very uſual both in the *Spring* and *Autumn*, you muſt be ſure to cloom up the Hives very cloſe, leaving the doors very ſmall; and, according to the ſeaſon of the year, to widen and ſtreighten them, as you may obſerve in the *Kalendar* towards the end of this Book inſerted.

Removing of Bees.

The beſt time to remove an old Stock, is a little before, or a little after *Michaelmas*; or if you have over-ſlipt that time, then about the end of *February*, or beginning of *March*, before they go much abroad, leſt it prevent their Swarming: or you may remove any time of the Winter, though not ſo well as in the aforeſaid ſeaſons.

For the removing of a *Swarm*, it's beſt to do it the Evening next after the Hiving.

Let the Weather be fair, as near as you can, when you remove; and let it be done in the Evening, when all the Bees are quiet.

The beſt way is thus: Take a board, about the breadth of the bottom of the Hive you intend to remove, and in the Evening, or two or three Evenings before you remove your Stock, lift it up, and bruſh the Bees that are on the Stool forwards; or let the board be a little ſupported by two ledges, to prevent the death of the Bees on the Stool; on this board ſet your Stock, and ſo let them ſtand till you remove them: when you come to remove them, ſtop up the door of the Hive, and ſet the board whereon the Hive ſtandeth on a *Hand-barrow*, and carry them to the place you intend, and there place them: by which means they are not at all diſturbed, nor a Bee injured, nor the Hive nor Combs cruſhed by the ſqueezing of the Cloth, nor yet a Cloth uſed about them.

Of the feeding of Bees.

This of all other things belonging to an *Apiary* is of leaſt uſe: Firſt, becauſe Bees that have not a probable ſtock of Honey to ſerve them over the Winter, are not fit to be kept: And then becauſe they that are Bee-Maſters, and have not care enough of them to keep them from ſpending that Stock they have in the Winter-time, muſt not expect to reap any conſiderable advantage by this profitable Creature, nor I preſume will ever take ſo much pains and care as is required in feeding them.

Yet are there ſome Stocks of Bees in the Spring-time, that may ſeem worthy our care to preſerve them; *viz.* ſuch that having

ving but a thin ſtock of Honey, and a good quantity of *Bees*, by means of a cold, dry and unſeaſonable Spring, cannot make ſuch timely proviſion, as in other years they might have done; yet in all probability may prove an excellent ſtock. It would prove a piece of groſs neglect of our own advantage, and a piece of cruelty to theſe diſtreſſed Animals, if we ſhould not lend our aſſiſtance.

Which may be ſeveral ways applied, but beſt by ſmall Canes or Troughs conveyed into their Hives, into which you may put your Food you give them; which muſt be daily continued, till the Spring-ſeaſon affords them eaſie and ſufficient proviſion abroad, Becauſe at that time their Combs are full of young *Bees*. *Manner of feeding.*

Of all Food, Honey is the beſt and moſt natural; which will go the farther, if it be mixed well with a moderate proportion of good ſweet Wort. Some preſcribe Toaſts of bread ſopped in ſtrong Ale, and put into the *Bee-hive*, whereof they will not leave one Crum remaining. Some alſo adviſe to put into the Hive dry Meal or Flour of Beans: others Bay-ſalt, roaſted Apples, *&c.* which are all very good. *Food for Bees.*

Take a handful of *Baum*, one dram of *Camphire*, half a dram of *Muſk* diſſolved in *Roſe-water*, as much yellow *Bees-wax* as is ſufficient, Oyl of *Roſes* as much; ſtamp the *Baum* and *Camphire* very well, and put them into the Wax melted with the Oyl of *Roſes*, and ſo make it up into a Maſs: let it cool before you put in the *Muſk*, for otherwiſe the heat will fume away moſt of the ſcent of it. *An experiment for improving of Bees.*

Take of this Maſs as much as an Hazel-nut, and leave it within the *Bee-hive*, it will much encreaſe the number of your *Bees*. You ſhall alſo finde both in *Honey* and *Wax* three times more profit than otherwiſe you ſhould have had. *Commonwealth of Bees.*

In *Kempen-land* in *Germany* (ſaith mine Author) I have ſeen about forty great *Bee-hives*; which contain, when they are full, about ſeventy pound weight in *Honey*, placed near a great Field ſown with *Buck-wheat*: And it was related to me of a truth by the Inhabitants, that the *Bees* did ſuck ſuch plenty of honey out of it, that in a fortnights time the ſaid *Hives* were all filled therewith. *A ſingular obſervation concerning the food of Bees.*

Alſo *Anniſeed* ſown near the *Apiary* is eſteemed an extraordinary delightſome food for *Bees*.

The principal aim of moſt *Bee-maſters* is advantage; and it hath been the general deſigne of Experimenters to diſcover which way this moſt induſtrious and profitable Creature may be multiplied and maintained with the leaſt expence, care and trouble, and alſo to the greateſt advantage; for they require no more than a houſe of Straw, unleſs you can afford them a better: their food they ſeek where it will never advantage you, nor any elſe, if they have it not: Your circumſpection and care only is required to order and preſerve them; which alſo is but lit- *Of the fruit and profit of Bees.*

tle, if you underſtand their natures and temper, and will ſeem much leſs, if you make it one of your Exerciſes of delight and pleaſure.

Yet do they return you an extraordinary recompence and reward for whatever you beſtow on them, as before we have obſerved.

But that which hath been principally deſigned, is to finde out ſome ways or means how, or after what manner the fruit and profit of *Bees* may be taken without the loſs of their Hives; it being a ſeeming act of cruelty to deſtroy the lives of theſe moſt induſtrious Creatures, to rob them of their goods.

Driving of Bees. The one way that hath been uſed to this purpoſe, is the driving of Bees after this manner: In *September*, or any time after they have done breeding, elſe will the honey be corrupted by the *Skaddons* in the *Combs*, place the Hive you intend to take with the bottom upwards, between three or four ſtakes, and ſet the Hive you intend to drive the Bees into over the ſame, as before we directed in the uniting of Swarms; then often clap the under-hive between your hands in the Evening, and ſo let them ſtand till the Morning, and then clap it again; and ſet the full Hive on the Stool, a little bolſtered up, that the Bees may have free Egreſs and Ingreſs: then clap the empty *Hive* again, and get as many Bees out as you can, which will repair to the other *Hive*. This way is ſomething troubleſome to the unexperienced, yet beneficial in ſuch caſes where you have a great ſtock of *Honey*, and few Bees in one *Hive*, and a ſmall ſtock of *Honey* in another; by which means you ſave the lives of moſt of your Bees, which will gladly exchange their hungry habitation for a more plentiful.

Exſection, or gelding of Combs. This is a way hath been practiſed by the Ancients, and hath been much endeavoured after to be revived again, though not with any good ſucceſs; for if you take away any part of their Combs in the *Spring*, they are then full of *Skaddons*, which ſpoil the *Honey*, and alſo deſtroy the breed of your Bees: If you take away the Combs in the *Autumn*, then will they want them in the *Spring* following to lay their Young in, which they uſually do before any new matter is to be found to build withal.

So that the new Inventions of making Bee-hives to open with doors to take out Combs at pleaſure, are fruitleſs and ridiculous Toys, publiſhed by ſuch that know not the nature of Bees, nor their work; who fix their Combs on every ſide, that you cannot eaſily open your door; and if you could, the Bees would prove too buſie for you to meddle with their Combs; whom if you ſhould overcome, yet the former inconveniencies would follow.

Others have adviſed to make Bee-hives to place the one over the other, and ſome to be placed the one at the end of the other ſucceſſively; that when the Bees have filled the one, another being added they would fall to work, and fill the next, and

leave

leave the former, and ſo fill ſeveral one after another; and that you may take the *Hive* that was firſt filled away for your uſe: and have alſo deſcribed unto us the particular ways of ordering theſe new-invented *Hives*, and how every particular thing is to be done, as though the Authors thereof had had long experience in it; which hath incouraged many to the proſecution of the deſigne.

Which I finde to deceive us in ſeveral particulars: for the *Bees* build Combs only at the former part of the Summer; and after they have prepared ſufficient Receptacles wherein to diſpoſe their *Honey*, and anſwerable to their number, their matter alſo being much waſted which they gather abroad for the making of their Combs, they then fall to work for the ſtoring of their *Cells* with food for the approaching Winter: ſo that whatever room you give them more, ſeems ſuperfluous, and rather proves a burthen than an advantage unto them. The next year alſo it's in vain to give them more room, unleſs it be to a Young Stock that could not, or had not time enough to build ſufficient the precedent Year, or to an Old Stock that was ſtreightned in room before, as uſually our Swarming Stocks are.

Alſo when you expect to take the top or fulleſt *Combs*, you will finde the *Bees* moſt there: for they will not (as ſome fondly imagine) deſert the more remote, and lie in the nearer *Combs*; but on the contrary, as I have often found.

But that which ſeems to me the moſt probable way (for I have not yet fully experienced it) is to make your *Hives* very ſmall, either the one over the other, or the one behinde the other; and if you finde they have a ſufficient ſtock of *Honey* to preſerve them in the remainder, you may take the moſt remote *Box* or *Hive* and place it the nethermoſt, and ſo drive the *Bees* into the other: but this alſo muſt be ſubmitted to farther Tryals.

To conclude from what we have before treated, I judge it the moſt prudential way to have in your *Apiary* a ſufficient ſtock of *Bees* kept for breeding and ſwarming, and another ſtock kept in large *Glaſs-hives*, whereof we have before diſcourſed, for the raiſing of great quantities of *Honey*, which they will much better do in thoſe *Hives*; and I ſee no reaſon why we ſhould judge it a greater piece of cruelty or inhumanity, to take away the lives of theſe Creatures (who have ſo ſhort and inſenſible a life, and die ſo eaſily) for their *Honey*, than to take away the lives of any other Animals to feed on their Carkaſſes; which is daily done, and that with very high degrees of torture: Neither can it be any loſs to the *Bee-maſter*, who may have an Annual ſupply by his ſwarming-ſtocks kept for that purpoſe, as the great Flocks of *Weathers* are yearly ſupplied from the Flocks of *Ewes*, and the large and vaſt fatning Ponds of *Carps* from the leſſer breeding Ponds.

Virgil. *Sed ſi jam prolis ſubito defecerit omnis,*
Nec genus unde novæ ſtirpis revocetur, habebit:

Which rarely happens to a careful *Bee-maſter*: but if it ſhould,

Idem. *Tempus & Arcadii memoranda inventa Magiſtri,*
Pandere.

Generation of Bees. then may you experiment the Invention of the *Athenian Bee-Maſter* in *Virgil*, wherewith in effect agrees the Experiment of our Modern and great Husbandman old Mr. *Carew* of *Cornwal*, which is thus: Take a *Calf* or *Steer* of a year old, about the latter end of *April*; bury it eight or ten days, till it begin to putrifie and corrupt; then take it forth of the Earth, and opening it, lay it under ſome hedge or wall, where it may be moſt ſubject to the Sun, by the heat whereof it will a great part of it turn into Maggots, which without any other care will live upon the remainder of the corruption: After a while, when they begin to have wings, the whole putrified *Carkaſs* would be carried to a place prepared where the *Hives* ſtand ready, to which, being perfumed with Honey and ſweet Herbs, the *Maggots* after they have received their wings will reſort.

Virgil. *Quis Deum hanc, Muſæ, quis nobis excudit Artem?*
Unde nova ingreſſus hominum experientia capit?

Or if you are unwilling either to credit or make tryal of this Experiment, you may purchaſe a new ſtock of your Neighbours; if not with Money, which is counted unfortunate, yet with the exchange of other Commodities. But what need we make proviſion againſt ſo improbable and unlikely accidents? For the trying of *Honey* and *Wax*, we will leave to the Experienced.

Making of Metheglin. There are ſeveral ways of making curious Drinks or Liquors out of *Honey*; ſome make it white and clear; not only by the pureneſs, and fineneſs, and whiteneſs of the *Honey*, but alſo by ſome particular Proceſs or Art they have: Others make it very good; yet partly by reaſon of the nature and colour of the *Honey*, and partly for want of judgment, it carries with it a more groſs and red tincture: but if the *Honey* be good, the tincture cannot be much injurious to the Drink.

Concerning the making whereof, we have met with ſome few Directions, which we ſhall here inſert.

A Receipt to make a pure Mead that ſhall taſte like Wine.

Take one part of Clarified *Honey*, and eight parts of pure Water, and boil them well together in a Copper Veſſel, till half the Liquor is boiled away: but while it boils, you muſt take

take off the Scum very clean; and when it hath done boiling, and begins to cool, Tun it up, and it will work of it ſelf: As ſoon as it hath done working, you muſt ſtop the Veſſel very cloſe, and bury it under ground for three Moneths; which will make it looſe both the ſmell and taſte of the *Honey* and *Wax*, and will make it taſte very like Wine.

Another Proportion.

Take of *Honey* Clarified twenty pound, and of clear Water thirty two Gallons; mingle them well together, and boil that Liquor half away, and take off the Scum very clean, *&c.* and if you will have it of an *Aromatick* taſte, you may add this proportion of Ingredients: *Viz.*

Flowers of *Elder*, *Roſemary* and *Marjerom*, of each an handful; of *Cinamon* two ounces, of *Cloves* ſix ounces, of *Ginger*, *Pepper* and *Cardamom*, each two ſcruples: Theſe will give it a pleaſant taſte.

Another Proportion thus.

To a dozen Gallons of the ſcummed *Muſt*, take *Ginger* one ounce, *Cinamon* half an ounce, *Cloves* and *Pepper* of each alike, two drams, all groſs beaten, the one half of each being ſowed in a bag, the other looſe; and ſo let it boil a quarter of an hour more.

Some mix their *Honey* and *Water* till it will bear an Egg; by which Rule you may make it ſtronger or ſmaller at pleaſure.

Another Proportion of Ingredients.

To ſixteen Gallons of *Muſt* take *Thime* one ounce, *Eglantine*, *Marjerom*, *Roſemary*, of each half an ounce, *Ginger* two ounces, *Cinamon* one ounce, *Cloves* and *Pepper* of each half an ounce, all groſs beaten; the one half boiled in a bag, the other looſe, *&c.*

Note, That all green Herbs are apt to make your *Methegelin* flat or dead, and that *Cloves* are apt to make it high coloured; and that ſcumming of it in the boiling, is not advantagious, but injurious, the Scum being of the nature of *Teſt*, helping to ferment and purifie.

Of

Of Silk-worms.

THis, though but a *Worm*, yet Glorious *Creature*, ſeems by the Relation of Credible Hiſtorians, to be but a Modern *Operator* in theſe *Northern Countries*, of that Excellent Commoditie *Silk*; and theſe *Worms* alſo are not ſo much encreaſed nor improved (eſpecially here in *England*) as they might be: every one almoſt is willing to undergo the trouble, and enjoy the pleaſure and benefit of feeding and preſerving them, were there but Food enough here for them; the deficiency whereof is the only *Remora* that impedes this moſt Noble Enterpriſe.

Their Food. The *Mulberry-leaves* are the principal, and I believe the only Food that will cheriſh and feed theſe Worms to advantage, at leaſt in theſe Countries; whatever ſome write to the contrary; as that at *Dublin* in *Ireland* the Worms have fed on *Lettuce* very readily, and that they grew as big as thoſe that were fed with *Mulberry-leaves*, and did ſpin as much Silk, eating alſo no other Food; and that they will eat the Herb called *Dandelion*. Others have tryed that way of feeding them with *Lettuce*, and not found the ſucceſs anſwerable. Some alſo affirm, that they will thrive on *Poplar-trees*, *Plum-trees*, and *Apple-trees*; the certainty whereof we leave to be decided by experience: But I ſee little reaſon for it, the *Silk-worm* being only an *Inſect*, and that it is generally the nature of *Inſects* to feed on ſome certain ſpecifical matter; therefore the only and principal way that is to be attempted for the propagating of this deſigne, is for ſome publick-ſpirited perſons to lay out ſome certain places of their Lands for the raiſing of *Mulberry-trees*, as before in our diſcourſe of *Fruit-trees* we obſerved.

Time and manner of hatching Silk-worms Eggs. About the beginning of *May*, when the Mulberry-tree begins to ſpread its Leaf, is the time the *Silk-worms* Eggs are as it were by nature adapted for a releaſe from their long confinement; that if you lay them in ſome window in the warm Sun, or carry them in a little Box between ſome pieces of *Say*, in ſome warm place about you, keeping them alſo warm in the night, they will ſoon appear in a new form: then cut ſome Paper full of ſmall holes, and lay over them, and over that ſome of your young Mulberry-leaves, and theſe ſmall Worms will eaſily finde their way to their natural Food; and ſo faſt as they are hatched, they immediately apply themſelves to the Leaves. After they are thus betaken to the Leaves, you may place on them Tables or Shelves at convenient diſtances, according to the number of your Worms, and proportion of place you have for them.

Their ſicknſſes. They are ſick four times in their feeding; the firſt commonly about twelve days after they are hatched, and from that time at the end of every eight days, according to the weather, and their good or ill uſage: during which time of every ſickneſs, which laſteth two or three days, you muſt feed them but very little,

little, only to relieve ſuch of them as have paſt their ſickneſs before the reſt, and thoſe that ſhall not fall into their ſickneſs ſo ſoon.

The whole time of their feeding is about nine weeks, during which time you may feed them twice a day, by laying the Leaves over them, as it were to cover them, and they will ſoon finde a way through them; and as they grow in ſtrength and bigneſs, ſo may you feed them more plentifully and often. It is good to let the Leaves be clear of Dew or Rain, before you give them unto the Worms: You may keep them ſpread on a Table, in caſe they be wet; you may gather and keep them two or three days without any great inconvenience, in caſe you live remote from Mulberry-trees, or the weather prove caſual. *The time and manner of feeding.*

You muſt obſerve to rid often their Shelves of their dung, and the remainders of the Leaves, by removing the Worms when they are faſt on the new Leaves laid on them; for then may you remove eaſily the Worms with the Leaves, the keeping clean of the Shelves, and the Room, being a principal means to preſerve them. Alſo remember to keep their Room warm in cold and wet weather, and to give them a little cool Air in hot weather.

Let not the Room you keep them in be too near the Tiles on the top of your Houſe, nor in any cold or moiſt Room below; but be ſure to avoid all extreams.

When they have fed as long as they are able, they look of clear and Amber-colour, and are then ready to go to work; therefore it is then adviſed, that you make Arches between their Shelves with *Heath* made very clean, or with branches of *Roſemary*, ſtalks of *Lavender*, or ſuchlike: whereupon the Worms will faſten themſelves, and make their bottoms, which in about fourteen days are finiſhed. *Their ſpinning.*

But the only way that I have ſeen practiſed, and the beſt way, is to make ſmall *Cones* of Paper, and place them with their ſharp ends downwards in rows; in each of which put a Worm, as they appear to you to be ready to go to work, and there will they finiſh their bottom more compleat, and with leſs waſte than on any branches whatever.

When they have finiſhed their bottoms, which will be in about fourteen days, then take ſo many as you intend to reſerve for Breeders, and lay them by themſelves, and the Worms within will eat their way out in four or five days time; and when they come forth, it is adviſed that you put them together on ſome piece of old *Say*, *Grogeram*, the back-ſide of old *Velvet*, or the like, made faſt againſt ſome Wall, or Hangings in your houſe; but I have known them ſucceed very well on Tables, *&c.* *Their breeding.*

Then will theſe Flies ingender, and the Male having ſpent himſelf dies, and ſo doth the Female after ſhe hath lain her Eggs: then take the Eggs up with the point of a knife, or ſuchlike, and put them into a piece of *Say*, or ſuchlike, and keep them

them in a Box amongſt Woollen Cloths, or ſuch other dry, and not warm place, till the next Spring. One of theſe Females will produce ſome hundreds of Eggs; therefore a few kept for Seed or Increaſe will be ſufficient, the reſidue put into an Oven after the baking of bread, *&c.* that it may be only hot enough to kill the *Worms*; for their gnawing their way out is ſome prejudice to the bottom.

The winding of the Silk. When you have obtained your bottoms, take off the Bags; and having found their ends, put ſix, ten, or more, in a Baſon of water together, where a little *Gum-Tragacanth* is mixed, and ſo you may eaſily winde them: The ſmall hairs of Silk ſeldom break; but if they do, they are eaſily found again. If the Worms are not well fed, the Silk is ſmall, and eaſily breaks.

Another way to make theſe Gummy Bottoms winde eaſie, is this: Take *Soap-boilers Liquor*, or *Lee* which is very ſharp and ſtrong, and put therein your Bottoms, and ſet them over the fire till the Liquor be ſcalding hot, and ſo let the Bottoms remain therein about half a quarter of an hour, till the Gumminеſs be diſſolved; then put the Bottoms into clean ſcalding water, and let them lie a while therein, then will they unwinde with much facility. A *Lixivium* made of Wood-aſhes very ſtrong, will do as well as the aforeſaid Soap-boilers Liquor.

There is a kinde of Tow, or rough ſort of Silk, that will not winde up with the other; which may be prepared, and good Silk made thereof, and indifferent alſo of the Bags themſelves.

The fine Skeins, after they have paſt through the Scowrers, Throſters, and Dyers hands, may compare with the fineſt.

CHAP.

CHAP. X.

Of the common and known External Injuries, Inconveniences, Enemies, and Diſeaſes incident to, and uſually afflicting the Husbandman in moſt of the Ways or Methods of Agriculture *before treated of; and the ſeveral Natural and Artificial Remedies propoſed and made uſe of for the Prevention and Removal of them.*

SInce the Excluſion of our Firſt Parents out of the ſtate of Bliſs or Paradiſe, all our Actions, Endeavours and Enterpriſes have been ſubject to the various and uncertain diſpoſitions of an Over-ruling Providence; and alſo of Fortune, and unexpected chances and accidents; and more eſpecially the ſeveral Actions and Imployments that are incident and belonging to this Noble Art of *Agriculture*, and its ſeveral branches before treated of, that no one exerciſed in *Husbandry* can promiſe himſelf a peculiar *Indemnity* from the uſual misfortunes that generally attend it; which is the cauſe that at ſome time that very Commodity is dear and ſcarce, which at another time is cheap and plentiful; and that ſome Husbandmen have excellent Crops, and good ſucceſs at the ſame time, when others have the contrary.

Theſe very conſiderations have not only ſtirred up the *Ingenious* to conſider of the Diſeaſes and Injuries themſelves, but alſo to ſeek after the means to avoid thoſe that of neceſſity attend them, and to prevent ſuch that may be prevented: which we finde diſperſed in ſeveral Authors; and alſo finde to have been made uſe of by many of our *Modern Ingenious Ruſticks*, and not yet made publick: And firſt we will diſcourſe of ſuch injuries and inconveniences that proceed

SECT. I.

From the Heavens, or the Air.

This *Iſland* is generally ſubject to great heat or drought in the Summer-time, which ſo much exſiccateth and waſteth the moiſture and Vegetative Nature of the Earth, that much of our common Field or open Land yields but a reaſonable Crop of Corn, nor our open and wide Paſtures, or dry Lands, much Graſs or feeding for Cattle; yet are theſe drieſt Summers moſt

Great heat or drought.

In Corn-Lands.

propitious unto us, and in them do we reap the moſt copious Crops; but it is becauſe we have ſo much low grounds under the Shelter, and ſo many Incloſures defended from the deſtructive and ſweeping Summer-Airs, where in thoſe dry years we have our richeſt Harveſts; ſo that Nature it ſelf, and common Experience, hath chalked out unto us a remedy for our dry, barren, and hungry Lands and Paſtures, whether Common or Appropriate, againſt heat and drought, the two principal inconveniencies attending thoſe Lands, if we had but the hearts of men to make uſe of it. It is ſaid that in *Cornwal* they begin to practiſe this *Husbandry*, and plant *Mounds* and *Fences* with Timber-Trees, which growing tall, do much preſerve the Land from malignant Airs, and yield a great profit beſides. See more of this Remedy before in the Chapter of Incloſures.

In planting Trees.

Heat or *Drought* alſo produces more particular inconveniencies or injuries, as to Trees ſown or planted abroad in the open Fields, or in Incloſures, Gardens, *&c.* which is a very great check or impediment to the Husbandman in propagating them; the preventions or remedies whereof are ſeveral.

1. In the drieſt and moſt barren Lands in *England*, if you ſow the ſame with the Fruit or Seed of Oak, Aſh, Beech, or any other wood whatſoever, you may alſo ſow the ſame Land at the ſame time with *Broom*, *Furze*, or ſuchlike; which will wonderfully thrive on the worſt of Land, and become a ſhelter to the other Trees; which when once they have taken ſufficient Root, will ſoon out-ſtrip the Furze or Broom: or you may raiſe Banks, and ſow them with *Furze*, which will ſoon make a Fence, under the ſhelter whereof you may Nurſe up other Trees; for it is moſt evident, that the greateſt Trees that grow on the barreneſt Lands, had their Original in the ſame places where they grow, and is moſt probable that they were thus defended by ſome ſmall Buſh or Brake from Cattle, Heat, Cold, *&c.* till they arrived to ſuch height that they could defend themſelves.

2. For ſuch Trees that are uſually planted in Hedg-rows, or other places of Incloſures, *&c.* which the heat and drought doth either impede their growth, or totally kill them, to the great diſcouragement of the Planter; adde to the Roots of them, on the Surface of the Earth, a heap of ſtones, which is the beſt Additament, and will keep the roots and ground about it cool and moiſt in the Summer, and warm in the Winter, and fortifie the Tree againſt Windes, *&c.* but where ſtones are not eaſily attained, heaps of *Fern*, or any other Vegetable, *Straw* or *Stubble*, *&c.* will preſerve the ground moiſt, and inrich it withal: but where neither ſtones nor Vegetables can be had conveniently, after the Tree is planted, and good Mould or Earth added to the Roots, raiſe a Hillock about it of any manner of Turf, Earth, *&c.* for it is not the height of the Earth above the ground about the Tree that injures it ſo much, as the depth of the Tree below the Surface or beſt Earth.

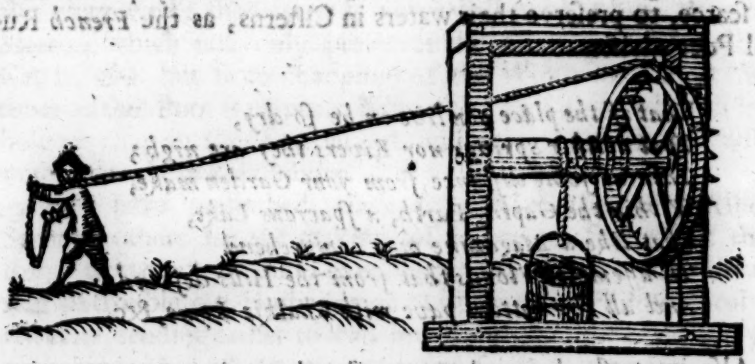
3. In Gardens, and ſuch near places where you may be at hand,

hand, and where you have choice Plants that ſuffer by heat, Shadow is a principal remedy, as before we noted, or water in ſuch places where it may be commanded.

In ſeveral places *Water* is the principal thing deficient to make them pleaſant and profitable, and the means whereby to procure it very tedious, coſtly, and difficult: It is ſeveral ways attainable. *Remedies for want of water.*

1. By ſinking of *Wells*, which where they are very deep, ſome uſe a large Wheel for Man or Beaſt to walk in to raiſe it; others uſe a double Wheel with Cogs, which makes it draw eaſier than the ordinary ſingle Wheel; but this is not ſo good a way as the double Wheel with *Lines*, the *Line* of the Wheel at your hand being ſmall and very long: this raiſeth a large Bucket of water with very much eaſe and ſecurity to the *Winder*; the Method being uſual, needs no deſcription here.

But if you have a deſire to raiſe a great quantity of water out of a Well in a little time, there cannot be a more expeditious way, than to make at the end of the *Winlace* a larger Wheel, that may be two or three times the Diameter of the *Winlace*, on which a ſmaller and longer Rope may be wound than that which raiſeth the Bucket, after this manner: So that when the Bucket



is in the Well, the ſmall Rope is all of it wound on the greater Wheel, the end whereof your Servant may take on his ſhoulder, and walk or run forward until the Bucket be drawn up: In which Operation, 1. Your Bucket may hold twenty or thirty Gallons, as you pleaſe, and yet drawn up with more eaſe than one of ſeven or eight the ordinary way. 2. The Bucket may have a round hole in the middle of the bottom, with a Cover fitted to it like the Sucker of a Pump, that when the Bucket reſts on the water, the hole may open, and the Bucket fill; and as ſoon as you raiſe it, the Cover ſtops it immediately, which prevents the diving of the Bucket. 3. On the outer Wheel may be made teeth, with a ledge of Wood ſo falling on it, that as you move forward it may not ſtop; but when the Bucket is as high as you intend it, then the ledge bearing againſt the teeth, ſtops the Bucket until you come to it, after the manner of the wheel of a Watch, Clock or Jack. 4. When the Bucket is up,

you may have a Receiver by, and a moveable Trough to ſlip under the Bucket, that when the Cover is raiſed by a ſmall cord faſtened to it in the inſide, the water may by it be conveyed into the Receiver. By this means many Tuns of water may be drawn up in a little time: If your Bucket be large, or your Well deep, or the way but ſhort you have to go, you may uſe a Horſe.

2. By bringing water in *Pipes* or *Gutters*, which is eaſily done, the Spring or Stream from whence you bring it being ſomewhat higher than the place where you deſire it.

3. By raiſing water by *Forcers*, *Pumps* or *Water-wheels*, many and ſeveral are the Inventions whereby to effect it; but none more eaſie, plain and durable, than the *Perſian-wheel* before-mentioned in the *Chapter* concerning the watering of Meadows.

4. By making of *Ciſterns* or *Receptacles* for water, either for the Rain or ſome Winter-ſprings to fill them, whereby the water may be kept throughout the Summer. In this are we very deficient; for on the Mountainous, dry, and upland parts of *Spain*, they have no other water than what they ſo preſerve from the Rain.

It being the Cuſtom in *Frante*, where in many places water is ſcarce, to preſerve their waters in Ciſterns, as the *French* Rural Poet adviſes.

That if the place you live in be ſo dry,
That neither Springs nor Rivers they are nigh;
Then at ſome diſtance from your Garden make,
Within the Gaping Earth, a ſpacious Lake,
That like a Magazine may comprehend
Th' aſſembled Flouds that from the Hills deſcend;
And all the bottom pave with Chalkie Lome, &c.

Alſo in *Amſterdam* and *Venice*, they keep their Rain-water in *Cellars* made on purpoſe for *Ciſterns*, capacious enough to contain water for the whole year, it being renewed as oft as the Rain falls. Why therefore may we not here in *England*, on our drieſt hills, make places, Pools, or Ciſterns ſufficient to contain water enough for our Cattle for our Domeſtick uſes, and alſo for our Garden-occaſions, if we were but diligent? few years there are but yield us plenty of ſhowres to ſupply them, though not enough to ſupply the defect of them; much more Rain falling here than on the Continent where thoſe Pools and Ciſterns are more uſed; for which cauſe this Iſland is by them termed *Matula Celi*; and yet have we ſo many thouſands of Acres of dry Lands uninhabited, untilled, and almoſt uſeleſs unto us from this only cauſe, and have ſo eaſie means to remedy it.

How to make Ciſterns to hold Water.

If you deſigne to make your *Ciſterns* under your houſe as a *Cellar*, which is the beſt way to preſerve it for your *Culinary* uſes; then may you lay your Brick or Stone with *Tarris*, and it will keep water very well; or you may make a Cement to joynt your

your Stone or Brick withal, with a Compoſition made of ſlacked and ſifted *Lime* and *Linſeed-Oyl*, tempered together with Tow or Cotten-Woull.

Or you may lay a Bed of good Clay, and on that lay your Bricks for the Floor; then raiſe the wall round about, leaving a convenient ſpace behinde the wall to ram in Clay, which may be done as faſt as you raiſe the wall: So that when it is finiſhed, it will be a *Ciſtern of Clay* walled within with Brick; and being in a *Cellar*, the Brick will keep the Clay moiſt (although empty of water) that it will never crack. This I have known to hold water perfectly well in a ſhadowy place, though not in a *Cellar*. Thus in any Gardens, or other places, may ſuch *Ciſterns* be made in the Earth, and covered over, the Rain-water being conveyed thereto by declining Channels running unto it, into which alſo the Alleys and Walks may be made to caſt their water in haſty ſhowres. Alſo in or near houſes, may the water that falls from them be conducted thereunto.

But the uſual way to make Pools of water on Hills and Downs for Cattle, is to lay a good Bed of Clay, near half a foot thick, and after a long and laborious ramming thereof, then lay another courſe of Clay about the ſame thickneſs, and ram that alſo very well: then pave it very well with *Flints*, or other *Stones*, which not only preſerves the Clay from the tread of Cattle, *&c.* but from chapping of the Winde or Sun at ſuch times as the Pool is empty. Note alſo, that if there be the leaſt hole or chap in the bottom, it will never hold water, unleſs you renew the whole labour.

Some have preſcribed ways for the making of Artificial Springs, others for the making of Salt-water freſh; but thoſe things being not yet fully experienced, we leave, being not willing to trouble our Husbandman with ſo great Philoſophical intricacies, tending rather to lead him from the more plain and advantagious Method, to imaginary and fruitleſs attempts.

Great Cold and Froſt.

Heat and *Drought* do not always attend us; nor do they ſo frequently afflict us, eſpecially in the greateſt part or proportion of this Country, but that we have alſo a ſhare of a ſuperabundant *Cold* and *Moiſture*: but ſeeing that they do not ſo frequently happen together as Heat and Drought uſually do, we will divide them. The cold that moſt afflicts the Husbandman, is the bitter Froſts that ſometimes happen in the *Winter* or *Spring*, and are beyond our power either to foreſee or prevent; yet that they may not injure us ſo far as otherwiſe they might, we propoſe theſe remedies or preventions.

Some Lands are more inclinable and capacitated by their nature or ſcituation to ſuffer by bitter Froſts, than others are; as thoſe that lie on a cold Clay or Chalk, more than thoſe that lie on a warm Sand or Gravel; thoſe that lie moiſt, than thoſe that lie dry; thoſe that lie on the *North* or *Eaſt*-ſides of Hills, than thoſe that lie on the *South* or *Weſt*: therefore it is good to plant or ſow ſuch Trees, Grains or Plants, that can leaſt abide

bide the cold in ſuch grounds that are moſt warmly ſeated.

And although that it is not an eaſie thing to alter the nature of the growth, yet is it feaſible to take away the offenſive moiſture that doth ſo much cool the Land, whereof more hereafter in this Chapter; and alſo to place ſuch Artificial defenſives againſt the cold, that may very much remedy this inconvenience; as we ſee it is moſt evident, that the Froſts have a greater influence where the Air hath its free paſſage, than where it is obſtructed: To which end we cannot but propoſe Incloſures, and planting of Trees as a remedy alſo for this Diſeaſe; for any manner of ſhelter preſerves the Corn, young Trees, *&c.* from the injury that otherwiſe would happen to them; as we ſee in Snows, and drowning of Meadows, that the Snow and water prove defenſive againſt the cold.

In Gardens, and other nearer Plantations, the Spring-froſts prove moſt pernicious; the general remedies whereof, where the ſite and poſition of the place is not naturally warm, are Walls, Pales, or other Edifices, or tall hedges or rows of Trees, whereof the *Whitethorn*, but chiefly *Holly* have the prehemiſtence: but theſe ſeem remote, and rather preventions againſt the winde; the more nearer are the application of new Horſe-dung, or Litter that hath lain under Horſes, which applied to the roots of any tender Trees or Plants, preſerves them from the deſtructive Froſts; and alſo by covering whole Beds therewith, preſerves the Plants or Roots therein: Alſo *Straw*, *Hawm*, *Fern*, or ſuchlike dry Vegetable, will defend any thing from the Froſts, although the Litter be to be preferred.

But ſuch things that are not to be touched or ſuppreſſed, as *Coleflower-plants*, *Gilliflower-ſlips*, *&c.* the placing of Sticks like ſome Booth, or ſuchlike over them, and covering them with a *Mat*, or *Canvas*, or ſuchlike, doth very much defend them; giving them Sun and Air in temperate days, makes them the more hardy, and preſerves their colour.

Furze, where it may conveniently be had, is a very excellent ſhelter and defence againſt Cold, being laid about Trees, or over Plants of what kinde ſoever: It breaks the violence of Winde and Froſt beyond any thing elſe; lying hollow of it ſelf, doth not that injury to Plants that other things do without ſupport; and proves many times better than a ſupported ſhelter.

Preſerving them alſo from Rain, unleſs as much as is ſufficient to nouriſh them, is a good prevention of Froſts; for the Froſt injureth no Plant ſo much as that which ſtands wet, as I have often obſerved, that *Cyprus-trees* and *Roſemary* ſtanding on very dry ground, have endured the greateſt Froſts, when others have periſhed by the ſame Froſts, ſtanding in moiſt ground, although more in the ſhelter. Alſo the moſt pernicious Froſts to Fruits ſucceed Rainy days; a dry Froſt rarely hurts Fruit.

Gilliflowers, and ſeveral other Flowers and Plants, receive their greateſt injury from wet; which if kept dry, endure ſevere colds the better.

Hot-

Hot-Beds are much in uſe for the propagating of Seeds in the Spring, *&c.* which when they are covered, prove ſecure remedies.

Conſervatories wherein to remove your tender Plants in the Winter, are a uſual prevention of cold; ſome whereof are made by ſome degrees warmer than others are, ſuitable to the ſeveral natures of the Plants to be preſerved.

But the compleateſt *Conſervatories*, are large leaves of boards to open and ſhut at pleaſure over your *Orange* or other Fruit-trees, cloſely pruned againſt a Wall or Pale, and planted either againſt your Chimney where you always keep a good fire, or againſt ſome Stove made on purpoſe. Aprecocks ſo planted againſt an ordinary wall with ſuch doors, muſt needs avail much in the Spring-time, to defend the young and tender Fruit from the ſharp Froſts; and is a much more practicable and ſurer way, than the bowing the branches into Tubs, as ſome adviſe: Others hang Cloaths or Mats over the Trees in froſty nights; but theſe are troubleſome.

It is evident, that part of the ſame Tree being under ſome ſhelter from the Rain will bear plenty of Fruit, when other part of the ſame Tree, being open to the Rain, bears but little in cold and deſtructive Springs, though alike obvious to the cold and winde: Therefore endeavour to preſerve your tender Wall-fruits from the wet, and you may the leſs fear the winde and cold.

To lay open the roots of Trees in the Spring to keep them backwards from ſpringing, is a very proper prevention againſt the Froſts in Apples, Pears, *&c.* for we finde a forward Spring that excites the early Fruit too ſoon, proves very injurious to it, in caſe any Froſts ſucceed.

The freezing of water alſo proves ſometime an injury to the Husbandman, either by hindering his Cattle from drink, or by deſtroying Fiſh that are confined in a ſmall Pond ſo frozen: To prevent the latter, if you can, let there be ſome conſtant fall of water into it, though never ſo ſmall, which will always keep a vent open ſufficient to preſerve the Fiſh, who can as ill live without Air, as Terreſtrial Creatures can without water. Any conſtant motion prevents a total Congelation.

If you lay a good quantity of Peaſe-hawm in the water, that part may lie above, and part under the water, it is obſerved that the water freezes not within the Hawm, by reaſon of its cloſe and warm lying together; which will prevent the death of Fiſh, as well as breaking of the Ice.

Fruit when it is gathered into the houſe, is ſubject to be ſpoiled by Froſts; therefore be careful to lay it in dry Rooms, either ſeeled, thatched, or boarded; for in froſty weather the condenſed Air, which is moſt in ſuch Rooms, adhering to the Fruit, freezeth and deſtroyeth it; which is uſually prevented, covering them with Straw, *&c.* but beſt of all by placing a Veſſel of water near them, which being of a colder nature than the Fruit,

Fruit, attracts the moiſt Air to its ſelf, to the preſervation of the Fruit, even to admiration.

Much Rain. Great Rains prove injurious to ſuch Lands that are of themſelves moiſt enough: for the remedy whereof, and to prevent ſuch injuries, ſee more in the next *Section*.

In ſuch Lands that lie at the bottoms or foot of Hills, where the great falls of Rain do annoy the Corn or Graſs, care is to be taken for the conveying away of the water by Channels or Paſſages made for that purpoſe.

In the time of Harveſt the greateſt Enemy the Husbandman uſually finds is Rain, againſt which the beſt remedy is Expeditiõn; *To make Hay whileſt the Sun ſhines.*

It is a grand neglect, that there are not ſome kinde of Artificial ſhelters made in Lands remote from our dwellings, for the ſpeedy conveyance of Corn into ſhelter in dripping Harveſts; and there to remain, till fair Weather and leiſure will admit of a more ſafe carriage.

Worthy of commendation is the practiſe uſed in *Sommerſetſhire, &c.* where they lay their Wheat-ſheaves in very large ſhocks or heaps in the Fields, and ſo place them, that they will abide any wet for a long time; when on the contrary in *Wiltſhire*, and other more *Southernly Counties*, they leave all to the good or bad weather, though far remote from Barns, ſometimes to their very great detriment; ſo naturally ſlothful and ignorant are ſome people, and naturally ingenious and induſtrious are other.

Where their Lands lie two or three miles from their Barns, as in ſome places in *Champion Countries* they do, the covered *Reekſtaval* (much in uſe Weſtward) muſt needs prove of great advantage in wet or dry Harveſts, to ſave long draughts at ſo buſie a time.

Where Lands lie at a far diſtance the one from the other, ſeveral Barns built as the Land requireth, are very convenient for the more ſpeedy houſing of the Corn, for the better preſerving of it, the more eaſie thraſhing it out, the more convenient fothering of the Cattle with the Straw, and for the cheaper diſpoſing of the ſoil for the improvement of the Land; where on the contrary, one great Barn cannot lie near to every part of a large Farm, nor can Corn be ſo well preſerved in it, nor with ſo much advantage diſpoſed into Mows not thraſhed, nor the fother nor ſoil ſo eaſily diſperſed.

High Winds. *High-winds* prove very pernicious and injurious to the Husbandman in ſeveral reſpects, to his *Buildings*, *Fruits*, *Trees*, *Hops*, *Corn*, *&c.* as many in the plain, open, or high *Countries*, by woful experience do finde: To prevent which as to Buildings, by common experience and obſervation we finde, that Trees are the only and moſt proper ſafeguard; for which the *Engh* is the beſt, although it be long a growing. Next unto that the *Elm*, which ſoon aſpires to a good height and full proportionable body, and is thickeſt in the branches, and will thrive in moſt Lands; but

any

any Trees are better than none. As to Fruits, Walls, Pales, or any other Buildings, are a good prevention and ſecurity for Garden-fruits; but for want of that, Hedges and Rows of Trees may be raiſed at an eaſie rate, and in little time.

As to Timber, or other Trees, which are alſo ſubject to be ſubverted or broken by high windes, to abate the largeneſs of their Heads, proves a good prevention, eſpecially the Elm, which ought to have its Boughs often abated, elſe will it be much more ſubject to be injured by high windes than any other Tree.

Hops, of any Plant the Husbandman propagateth, receiveth the moſt damage from high windes, which may in ſome meaſure be prevented. Againſt the Spring-windes, which nips the young Buds, and afterwards bloweth them from the Poles, a good Pale or Thorn-hedge much advantageth; but againſt the boyſterous windes, when they are at the tops of the Poles, a tall Row of Trees incompaſſing the whole *Hop-Garden* is the beſt ſecurity in our power to give them. Alſo be ſure to let their Poles be firm and deep in the ground.

As to *Corn*, windes ſometimes prove an injury to it in the *Ear*, when they are accompanied with great Rains, by lodging of it: but the greateſt injury to it is in the Graſs, when it is young, (I mean Winter-corn) the fierce bitter blaſts in the Spring deſtroying whole Fields: The only and ſure remedy or prevention againſt this Diſeaſe is Incloſure, as before we noted of Cold.

Thunder and Tempeſt, Hail, &c.

In *Spain*, *&c.* where the Miſt of Superſtition hath dimmed the Spiritual and Natural ſight, the Ringing of Sacred Bells, the uſe of Holy Water, *&c.* are made uſe of to Charm the Evil Spirit of the Air, which very frequently in thoſe hotter Climates terrifies the Inhabitants, that he may be a little more favourable unto them than others: But it cannot enter into my thoughts or belief, that any thing we can do here, either by Noiſes, Charms, *&c.* or by the uſe of Bays, Lawrel, *&c.* can prevail with ſo great a Natural Power, and ſo much beyond our Command; Prayers unto God excepted, which are the only Securities and Defenſives againſt ſo Potent and Forcible Enemies.

Mildews.

Blighting and *Mildews* have been generally taken to be the ſame thing, which hath begotten much errour; and the ways and means uſed for the prevention and cure, have miſcarried through the ignorance of the Diſeaſe: For

Mildew is quite another thing, and different from *blaſting Mildews*, being cauſed from the Condenſation of a fat and moiſt Exhalation in a hot and dry Summer, from the Bloſſoms and Vegetables of the Earth, and alſo from the Earth its ſelf; which by the coolneſs and ſerenity of the Air in the night, or in the upper ſerene Region of the Air, is condenſed into a fat glutinous matter, and falls to the Earth again; part whereof reſts on the leaves of the Oak, and ſome other Trees whoſe leaves are

ſmooth, and do not eaſily admit the moiſture into them, as the *Elm* or other rougher leaves do; which *Mildew* becomes the principal Food for the induſtrious Bees, being of its ſelf ſweet, and eaſily convertible into Honey.

Other part thereof reſts on the Ears and Stalks of Wheat, beſpotting the Stalks with a different (from the natural) colour; and being of a glutinous ſubſtance by the heat of the Sun, doth ſo binde up the young, tender, and cloſe Ears of the Wheat, that it prevents the growth and compleating of the imperfect Grain therein; which occaſioneth it to be very light in the Harveſt, and yield a poor and lean Grain in the Heap.

But if after this Mildew falls, a ſhowre ſucceeds, or the winde blow ſtifly, it waſheth or ſhaketh it off, and are the only natural Remedies againſt this ſometimes heavy Curſe.

Some adviſe in the Morning after the Mildew is fallen, and before the riſing of the Sun, that two men go at ſome convenient diſtance in the Furrows, holding a Cord ſtretched ſtreight betwixt them; carrying it ſo, that it may ſhake off the Dew from the tops of the Corn, before the heat of the Sun hath thickned it.

It is alſo adviſed to ſow Wheat in open grounds, where the winde may the better ſhake off this Dew; this being looked upon to be the only inconvenience Incloſures are ſubject unto: but it is evident, that the Field-lands are not exempt from Mildews, nor yet from Smut where it is, more than in Incloſed Lands.

The ſowing of Wheat early hath been eſteemed, and doubtleſs is the beſt Remedy againſt Mildews; by which means the Wheat will be well filled in the Ear before they fall, and your increaſe will be much more: As for curioſity ſake, Wheat was ſown in all Moneths of the Year; that ſown in *July* produced ſuch an increaſe that is almoſt incredible. In *France* they uſually ſow before *Michaelmas*.

Bearded-Wheat is not ſo ſubject to Mildews as the other, the Fibres keeping the Dew from the Ear.

Hops ſuffer very much by Mildews; which if they fall on them when ſmall, totally deſtroy them. The Remedies that may be uſed againſt it, is when you perceive the Mildews on them, to ſhake the Poles in the Morning.

Or you may have an Engine to caſt water like unto Rain on them, which will waſh the Mildew from them: And if you have water plenty in your Hop-garden, it will quit the coſt, in ſuch years Hops being uſually ſold at a very high rate.

SECT.

Sect. II.

From the Water and Earth.

Next unto those *Aërial* or *Celestial* injuries which descend upon us, we shall discourse of such that proceed from the *Water* and *Earth*, that do also in a very great measure at some times and in some places afflict us, proving great impediments to those Improvements that might otherwise be easily accomplished, and also great detriments unto the Countryman upon that which he hath already performed.

Much water offending.

As the want of water in some places proves a great impediment and injury to the improvement and management of Rustick Affairs, so doth the superabundant quantity; either from the flowings of the Sea over the low Marsh-Lands at Spring-tides and High-waters, or from great Land-flouds, but principally from the low and level scituation of the Land, where it is subject to Springs, Over-flowings, *&c.*

Over-flowing of the Sea.

It is evident that much good Land hath for many Ages yielded little benefit, by reason of the high waters that sometimes have covered it over, and destroyed that which in the intervals hath grown; and hath also over-flown much good Land so frequently, that it hath become useless: but by the extraordinary charge, labour, art and industry of some publick-spirited persons, very great quantities thereof have been gained from the power of that Grand Enemy to Husbandry, as may be observed in those vast Levels of rich Land in *Lincolnshire*, and *Yorkshire*, *Cambridgeshire*, *&c.* in our Age recovered. Many other vast Flats and Levels there are on the Borders of this Kingdom, that are beyond the power, strength, or interest of a private Purse to attempt, yet to the publick at a publick charge would redound to an infinite advantage, and not only maintain thousands at work, (imployment being the greatest check to factious spirits) but bring in an yearly increase of wealth, one of the principal Supports of this Kingdom against its Enemies, and that without the hazards of an *Indian Voyage.*

Land-flouds.

Land-flouds in some places, especially on the great Flats and Levels, prove a great annoyance to the Husbandman, that it is of equal concernment to divert the Land-flouds from some Lands, as to drain the water that resides upon it, and otherwise annoys it.

As we see in the Draining the Great Level between *Yorkshire* and *Lincolnshire* by the Isle of *Axholm*, where the great River *Idle*, Navigable of its self, that formerly passed with its great Land-flouds through the vast Level on the *Yorkshire* side of *Axholm*, by the Art and industry of the Drainers, through a new Cut, is carried into *Trent* on the other side of the Isle, that the Draining of that Great Level, which otherwise might seem impossible to be done, by that very means became most feasible: So

that here we need ſay no more, but that as the conveniency of the place will permit, you divert the Land-flouds and Streams before you attempt a through Draining, if it be feaſible and requiſite, leſt you multiply your coſt, and be at laſt fruſtrate of your purpoſe.

Standing Waters. The greateſt of our In-land annoyances to Husbandry, occaſioned by water, is from the ſtanding or reſiding of water on our flat and level Mariſhes, Meadows, or other Lands, whether occaſioned from Rains, Springs, or otherwiſe.

Where there is any deſcent or declining of Land, by cutting Drains to the loweſt part, it is moſt eaſily performed.

But where it is abſolutely flat and level, it is much more difficult; yet are there few ſuch Levels, but there are places or Currents for the water to paſs out of them, which you muſt ſink deep and wide enough to drain the whole, and then make ſeveral drains from each part of the Marſh or Level, beginning large and wide at the mouth of the Drain, and leſſening by degrees, as it extends to the extreams of the Land you drain. Be ſure to make the Drains deep enough to draw the water from under the Marſh or Bog, and make enough of them that may lay it throughly dry.

If you cannot make a paſſage deep enough to take the water away from the bottom of your Drain, which in many places is a great impediment of this improvement, either by reaſon that you cannot cut through anothers Land, or that the paſſage be long, or that ſome River is near, which will be apt to revert upon you, or ſuchlike, then may an Engine commanded by the winde be of great uſe and effect, that which by any other way could not be done; the deſcription whereof ſee before in the third Chapter. According to the height you raiſe the water, may you proportion the greatneſs or ſmalneſs of your Engine. You need not fear winde ſufficient at one time or other to keep your Drains empty: for during the greateſt Calms, are uſually the greateſt Droughts; and in the wetteſt ſeaſons windes are ſeldom wanting, eſpecially on Flats and Levels.

Over-much moiſture proves alſo very injurious to Corn, and other Plantations; the uſual remedy whereof is to lay the Land high in Ridges, and cut Drains at the ends of the Furrows to carry away the ſuperfluous water.

In Orchards and Gardens it uſually hinders the growth and proſperity of Trees and other Plants; againſt which, the beſt remedy is to double the Land; that is, by abating the one half thereof about a foot more or leſs, according to the nature and goodneſs of the Soil, in long Walks or Rows about ſeven or ten foot broad, as to you ſeems beſt and moſt convenient, and caſt it on the other in banks or borders; ſo that you will then have thoſe banks lie dry to the bottom of your Walks, and all of the beſt of the Mould, on which you may plant your Trees, &c. where they will thrive as well as on any other drier Land, being planted hallow.

Take this as a general Obſervation in *Agriculture*, that moſt of the barren and unimproved Lands in *England* are ſo, either becauſe of Drought, or the want of Water or Moiſture, or that they are poyſoned or glutted with too much: therefore let every Husbandman make the beſt uſe of that water that runs through his Lands, and by preſerving what falls upon his Lands, as we have at large before directed in this Treatiſe, and drain or convey away that which ſuperabounds and offends; then would there be a far greater plenty of all manner of Tillage and Cattle, to the great inriching of this Kingdom.

Water is alſo very offenſive in our Dwelling-houſes, that we cannot make Cellars for Beer, *&c.* which may be ſeveral ways cured or prevented.

Either by laying the bottom and ſides of the Cellar with Sheet-Lead, and a Floor of boards thereon to preſerve it from injury. Several ſuch Cellars there are in ſome Cities and Towns that lie low in the water; but this is too coſtly a way for our Husbandman.

Another way is to joynt your Bricks or Stone with *Tarris*, or the *Cement* before deſcribed in this Chapter for the keeping in of water in *Ciſterns*.

Alſo you may Bed your Cellar with Clay, and then Brick or Stone it over, after the ſame manner as we directed before in this Chapter for the keeping of water, *&c.*

Or you may ſink a Well or Pit near your Cellar, and ſomewhat lower than it, into which you place a Pump, that at ſuch times as water annoys you, it may by that means be removed.

Sometimes it happens that the Floor of the Houſe you live in, or the Barn you lay your Corn in, are damp or moiſtened by certain Springs, that ſome times or other do annoy them, to your great detriment, as well to your health, as injury to your Goods or Corn; which if the ſcituation of the place will bear it, as moſt uſually it will, the cutting of a Trench or Ditch round about the ſame, of ſuch depth as you may drain it dry by the fall that is naturally from it, will cure this diſeaſe. This Ditch or Trench may be paved, walled on the ſides, and covered as you pleaſe; ſo that the Brick or Stone of the Wall on the ſide next the Houſe or Barn be not laid with Mortar, to prevent the iſſue of the Water from the Earth into it.

Much Land there is in *England* that is capable of a very great improvement, by removing thoſe common and ſtubborn Obſtacles, as Stones, Shrubs, Gorſs, Broom, *&c.* which are naturally produced in many places; and the faint-hearted, lazy, and ſometimes beggerly Husbandman, had rather let them grow and ſuck out the Marrow and Fat of his Land, than beſtow any coſt or pains to remove them, and is contented with now and then a bundle of Buſhes, *&c.* when the removal of them would not only be an improvement of his Land by their abſence, but the materials themſelves, by a right and judicious way of ordering them, might become alſo an additional improvement. *Stones, Shrubs, &c.*

As

As firſt of *Stones*, which being picked up, and laid on heaps about the roots of either Fruit or Timber-trees planted on the Bounds, and in Rows on the Land, is a very great help and advantage to the growth of ſuch Trees, and ſaves the labour of carrying them off the ground; which charge uſually exceeds the charge of picking them up: This only where Stones offend, or are injurious.

Shrubs, *Goſs*, *Broom*, *&c.* prove a very great annoyance to Husbandry; and the difficulty and charge in plucking them up, is the principal impediment to their removal, to ſuch that are ignorant of the moſt dextrous ways uſed to that purpoſe; the beſt whereof I finde to be this, deſcribed by Mr. *Plat*; *Viz.* A very ſtrong Inſtrument of Iron, like unto a Dung-fork, with three Grains or Tines, only much bigger, according to the bigneſs of the Shrubs you uſe it about; the upper part thereof is a very ſtrong and long *Stail*, or handle, like a Leaver: Now ſet this Inſtrument at a convenient diſtance from the Root ſlopewiſe, and with a Hedging-beetle drive it in a good depth; then lift up the *Stail*, and place under it acroſs an Iron-bar, or ſuchlike *Fulciment*, to keep it ſtreight, and that it ſink not into the ground.

Then take hold of the Cord that before ought to have been faſtened to the top of the *Stail*, and by this means may you Eradicate any *Shrubs*, *&c.* If it will not do at once, place it on the other ſide, *&c.*

Theſe *Buſhes*, *Brakes*, and ſuchlike, though they are of little worth or uſe for any other thing, yet are they very neceſſary and beneficial to improve the Land by burning them, being dry, either by themſelves, or under heaps of Turf, Earth, *&c.* as before we obſerved. *Chap. 5.*

Weeds. Some Lands are more prone and ſubject to Weeds, and that in ſome years than other, which is often occaſioned by water ſtanding on it, deſtroying the Corn and ſuch Seeds that are uſually ſown in it, and nouriſhing ſuch Weeds that moſt delight in moiſture; the only remedy whereof is to lay it dry, and add ſome convenient drying and lightning materials or compoſts thereon, as *Sand*, *Aſhes*, *&c.*

Alſo ſome ſorts of Dungs or Manures cauſe Weeds, as Dung made of *Straw*, *Hawm*, *Fern*, or ſuchlike, laid on Lands in any great quantity, without any other mixture of *Horſe-dung*, *Sheeps-dung*, *Lime*, *Aſhes*, or ſuchlike hot Compoſt, which do in ſome meaſure correct the cold and ſluggiſh quality of it; but in ſome years, and on ſome Lands, any ordinary cold Dung begets Weeds, which injure the Corn more than the fatneſs of the Dung advantages; therefore *Lime*, *Marle*, *Chalk*, *Aſhes*, *&c.* are to be preferred in moſt Lands.

Weeds in Paſture-lands are beſt deſtroyed by burning of it in Turfs, (as before we diſcovered) or by Plowing of it without burning. *Chap. 5.*

Ruſhes, Flags, &c. *Ruſhes*, *Flags*, and ſuchlike Aquaticks, are beſt deſtroyed by draining;

draining; ſo that you cut your Drains below the roots thereof, that it may take away the matter that feeds them.

The *Sowthiſtle* proves a great annoyance to ſome Lands, by killing the Graſs, Corn, *&c.* although it be a ſure Token of the ſtrength of the Land: The way to deſtroy them, is to cut them up by the roots before feeding-time; the advantage you will receive, will anſwer your expence, and more. *Sowthiſtle.*

The way to deſtroy this ſo common and known an annoyance, is to Mow it off in the Spring, whether with an Iron or Wooden Sythe, it matters not, for it will eaſily break; which work reiterate the ſame year as faſt as it grows, and it is confidently affirmed, that it will kill and deſtroy the *Fern* for ever after. *Fern.*

Improvement and bettering the Land by *Soyling*, *Marling* or *Liming*, *&c.* is alſo a principal remedy againſt all manner of *Broom*, *Furze*, *Heath*, and other ſuchlike trumpery, that delight only in barren Lands.

Very much differing from Mildews is the blighting of Corn; the Mildews proceeding from a different cauſe, and happening only in dry Summers, when on the contrary Blighting happens in wet, and is alſo occalioned through the too much fatneſs and rankneſs in Land; as is obſerved that ſtrong Lands are uſually ſown with *Barley*, *Peaſe*, or ſuchlike, to abate the fertility thereof before it be ſown with Wheat, which would otherwiſe be ſubject to Blights or Blaſting. *Blights and Smut.*

Alſo Wheat ſown on level or low Land, in moiſt years is ſubject to the ſame inconveniencies; for you may obſerve, that the Wheat that grows on the tops of the ridges in moiſt years, to be better and freer than what grows in the Furrows, which is uſually blighted by means of water and fatneſs lying more about it than the other; for Wheat naturally affects to be kept dry or moiſt and ſtrong ground: Therefore as moiſture, and the richneſs of the ground together, occaſions this diſeaſe, by knowing thereof you may eaſily remedy it, by laying your Land on high Ridges; which if it be never ſo rich, the Wheat growing thereon will hardly be blighted, if not overcome with moiſture.

Smut ſeems to proceed from the ſame cauſe; therefore need we to ſay the leſs. *Smut.*

Only that ſometimes ſmuttineſs proceeds from other cauſes, as by ſowing of *Smutty-corn*, by ſoiling the Land with rotten Vegetables, as *Straw*, *Hawm*, *Fern*, &c.

It is confidently affirmed, that the ſmutty Grains of Wheat being ſown, will grow and produce Ears of Smut: but I confeſs I have not yet tryed, and ſhall therefore ſuſpend the belief thereof till I have.

The ſowing of Wheat that is mixed with Smut, doth generally produce a Smutty Crop (whether the Smut it ſelf grow or not) unleſs it be firſt prepared by liming of it; which is thus done: firſt ſlake your *Lime*, and then moiſten your Corn, and ſtir them well together, *&c.* and ſow it.

Or by ſteeping of it in *Brine*, either of which are good preventions againſt the Smut.

You

You may alſo prepare the ground by *Liming*, or other ways of inriching it, with ſharp or ſaline Dungs or Soils, and it will produce Corn free from Smut; for it is moſt evident, that Land often ſown with the ſame Grain, or much out of heart, produces a ſmutty Crop, as may be eaſily perceived where the ſame Seed hath been ſown on two ſorts of Land of different goodneſs, the one Crop hath been ſmutty, the other free; ſo that Smuttineſs ſeems to be a kinde of ſickneſs incident to Corn, which may by the aforeſaid means be cured; which if the Smuts themſelves would really grow, and produce Smut again, all Remedies propoſed, and attempts to that purpoſe, were needleſs.

SECT. III.

From ſeveral Beaſts.

Againſt the Treſpaſſes of Domeſtick Cattle breaking out of your Neighbours grounds into yours, it's needleſs to ſay any thing, every one knowing that a good and ſecure Fence is the beſt prevention, and a Pound the beſt remedy or cure, if the other will not ſerve. But other Beaſts there are that no ordinary Fences will keep out, and will hardly be brought to the Pound.

Foxes. As *Foxes*, which uſually torment the laborious Husbandman, by taking away and deſtroying his *Lambs*, *Poultry*, *Geeſe*, &c. that in ſome places near great Forreſts and Woods, they can hardly keep any thing but under lock and key: againſt which Gins are uſually made uſe of; which being baited, and a Train made by dragging raw fleſh acroſs his uſual paths or haunts unto the Gin, it proves an inducement and a ſnare to excite him to the place of his deſtruction.

A Fox will prey on any thing he can overcome, and feeds on all ſorts of Carrion; but the food he moſt delights in is Poultry. He proves injurious and deſtructive to Coney-warrens, and deſtroys Hares alſo, whom he taketh by his ſubtilty and deceit.

They may be taken with Greyhounds, Hounds, Terriers and Nets, as well as Gins.

It is alſo a very commendable and Noble Exerciſe in our Nobility and Gentry, to Hunt theſe deſtructive Beaſts; and did they proſecute it at their breeding times, and at other times alſo, with an intent to deſtroy the whole Breed or Kinde, there would ſoon be an end of them.

Otters. The *Otter* is a pernicious deſtroyer of Fiſh, either in Pond or Brook, and her abode is commonly under the root or ſtem of ſome Tree near the water, whence ſhe expects her food: By her diving and hunting under water, few Fiſh are able to eſcape her.

They are taken either by inſnaring them under the water by the Rivers ſide, as you may do a Hare on the Land with Harepipes; or by hunting them with Dogs, where you alſo make uſe of the Spear.

In

In ſeveral places the Husbandman ſuffers much by *Coneys* and *Hares* that feed down his Corn, *&c.* when it is young, eſpecially in hard Winters; and in many places they have not liberty to ſecure their own from them. *Coneys, Hares, &c.*

The Hare is no great deſtroyer of Corn; yet where there are many of them, the Countryman may leſſen their number as he ſees cauſe; either by Hunting or Courſing them at ſeaſonable times, or by ſetting of Hare-pipes where he finds their haunts, or by tracing them in the Snow.

Coneys are deſtroyed or taken either by Ferrets and Purſenets in their Buries, or by Hayes, or by Curs, Spaniels, or Tumblers bred up for that ſport, or by Gins, Pitfalls or Snares, which ſome Ingenious Countrymen will prepare; the goodneſs of the Game, rather than the prevention of the damage, prompting them thereto.

It is not a little injury theſe Animals do to *Warrens*, *Dove-houſes*, *Hen-rooſts*, &c. but the ways by taking them in *Hutches*, and in ſmall Iron-gins like Fox-gins, are ſo well known, that I need ſay nothing of it. *Poll-cats, Weaſels and Stotes.*

Only that to prevent *Poll-cats*, or ſuchlike, from deſtroying your *Pigeon-houſe*, be ſure, if you can, to erect it where you may have a Ditch or Chanel of Water to run round it, and it will keep thoſe Vermine from making their Burroughs under the ground.

Moles are a moſt pernicious Enemy to Husbandry, by looſening the Earth, and deſtroying the Roots of *Corn*, *Graſs*, *Herbs*, *Flowers*, *&c.* and alſo by caſting up Hills, to the great hinderance of *Corn*, *Paſtures*, &c. *Moles, or Wonts.*

The common and uſual way of deſtroying them is by Traps that fall on them, and ſtrike the ſharp Tines or Teeth through them; and is ſo common, that it needs no deſcription.

But the beſt and compleateſt ſort of Inſtrument to deſtroy them that I have yet ſeen, is made thus: Take a ſmall board of about three inches and a half broad, and five inches long: on the one ſide thereof raiſe two ſmall round Hoops or Arches, at each, one end like unto the two end-Hoops of a Carriers Waggon, or a Tilt-boat, capacious enough that a Mole may eaſily paſs through them: in the middle of the board make a hole about the bigneſs that a Gooſe-quill may paſs through; ſo is that part finiſhed: then have in readineſs a ſhort ſtick, about two inches and a half long, about the bigneſs that the end thereof may juſt enter the hole in the middle of the board. Alſo you muſt cut a Haſel, or other ſtick, about a yard, or yard and half long, that being ſtuck into the ground, may ſpring up like unto the Springs they uſually ſet for Fowl, *&c.* then make a link of Horſe-hair very ſtrong that will eaſily ſlip, and faſten it to the end of your ſtick that ſprings: Alſo have in readineſs four ſmall hooked ſticks; then go to the Furrow or paſſage of the Mole, and after you have opened it, fit in the little board with the bended Hoops downwards, that the Mole when ſhe paſſes that

way, may go directly through the two ſemicircular Hoops: Before you fix the board down, put the Hair-ſpring through the hole in the middle of the board, and place it round, that it may anſwer to the two-end Hoops, and with the ſmall ſtick (gently put into the hole to ſtop the knot of the Hair-ſpring) place it in the Earth in the paſſage, and by thruſting in the four hooked ſticks, faſten it, and cover it with Earth; and then when the Mole paſſeth that way, either the one way or the other, by diſplacing or removing the ſmall ſtick that hangs perpendicularly downwards, the knot paſſeth through the hole, and the Spring takes the Mole about the neck. Though this deſcription ſeem tedious, yet the thing is very plain, and eaſily performed, and much cheaper, ſurer and feaſible than the ordinary way.

Others deſtroy them very expeditiouſly by a *Spaddle*, waiting in the Mornings when they uſually ſtir, and immediately caſt them up; eſpecially about *March* when they breed, by turning up the Hills whereunder they lay their Young, they uſually making their Neſts in the greater Hills, and are moſt eaſily diſcerned: then alſo will the Old Ones come to ſeek their Young, which you may preſently take.

The *Pot-trap* is by ſome much commended, which is a deep Earthen-veſſel ſet in the ground to the brim in a Bank or Hedg-row; which wiſely ſet and planted at all times, but eſpecially in the natural ſeaſon of Bucking-time, about *March*, will deſtroy them inſenſibly.

Alſo where Moles annoy your Gardens, Meadows, or ſuch places where you are not willing to dig or much break the ground, fuming the holes with Brimſtone, Garlick, and other unſavoury things, will drive them out of the ground that was before infeſted with them.

But the putting a dead Mole in a Common Haunt, will make them abſolutely forſake it.

Mice or Rats. Every Countryman almoſt is ſenſible of the great injuries and annoyances they receive from theſe Vermine, both in the Fields where they raiſe Nurſeries of Trees, in their Gardens where they ſow and plant Beans, Peaſe, *&c.* and in their Houſes, Barns, and Corn-reeks.

In the Fields, Orchards, Gardens, *&c.* I know no readier way to deſtroy them, than by placing an Earthen-pot in the ground, and covering it with a board, with a hole in the middle thereof, and over the board to lay *Hawm* or ſuchlike rubbiſh, under which the Mice ſeek for ſhelter, and ſoon finde their Trap to receive them.

The uſual way of building Reeks of Corn on *Stavals* ſet on ſtones, is the only prevention againſt Mice, and has proved ſo ſucceſsful, that in ſome places large Edifices are built on ſuch ſtones, that they ſupply the defect of Barns, being covered like them.

Granaries alſo I have ſeen built after the ſame manner: Binnes or Hutches for Corn may be placed on Pins like the other, and

prove

prove ſecure places for Corn againſt theſe pernicious Vermine; but great caution muſt be uſed, that no Stick, Ladder, or other thing lean againſt theſe places, leſt the Mice finde the way to come where you would not have them.

In your *Flower-gardens*, *Apiary*, or in the ſeveral Rooms of your Houſe, Traps may be placed to deſtroy them, unleſs where you can conveniently keep a Cat, the only Enemy and Deſtroyer of Mice and Rats. *Arſenick*, or the Root of *White-hellebor* will deſtroy them, being given with Sugar, or ſuchlike mixture: The laſt is the beſt, becauſe it deſtroys only Rats and Mice.

SECT. IV.

From Fowls.

As the beſt of Contents this World affords hath its part or ſhare of trouble and vexation, ſo this pleaſant and excellent *Ruſtick Life* and *Imployment*, is not free from care and trouble how to preſerve it ſelf from thoſe Enemies and Plagues that daily attend it: Sometimes the *Heavens* frown, the *Waters* ſwell, the *Bryers* ſnarl, the *Wilde Beaſts* are envious at our innocent and moſt delectable enjoyments; and if theſe withdraw their evil influence, yet have we the Fowls of the *Air*, *Inſects*, and ſeveral other *Evils* to encounter withal; which without our diligent care and induſtry, are ready to bereave us of the beſt part of the Fruits of our labours.

Kites, Hawks, &c.

As we frequently obſerve that *Kites*, *Hawks*, and other Birds of Prey, wait for *Pigeons*, *Chickens*, tame *Pheaſants*, &c. therefore is it very neceſſary, that the *Countryman* keeps a Fowling-piece ready fitted and charged, which is the beſt means to deſtroy and ſcare them away.

Alſo you may place ſmall Iron-gins, about the breadth of ones hand, made like a Fox-gin, and baited with Raw Fleſh, whereby I have caught very large Hawks.

Alſo by the ſtreining of Lines, or pieces of Nets, over the places where you keep tame *Pheaſants*, *Chickens*, or ſuchlike, will fray them away.

The cutting down of Trees about your Pigeon-houſe will keep them from haunting it ſo much as otherwiſe they would do.

Crows and Ravens, &c.

Crows, *Ravens*, *Rooks* and *Magpies*, are great annoyances to Corn, both at Seed-time, pulling it up by the Roots whileſt it is young, and feeding on it alſo at the Harveſt; a good Fowling-piece is the beſt Inſtrument for the preſent: But the only way to deſtroy the kinde of them, and make their Flocks a little thinner, were by ſome Publick Law to incourage the deſtruction of their Neſts and Young, which are ſo obvious at the building-time, that it ſeems to be a very feaſible work, and much to be preferr'd before *Crow-nets*, *&c.*

Several pretty Inventions of Scare-crows there are to keep the

Corn free from them, amongſt which this is eſteemed the moſt effectual; *viz.* To dig a hole in ſome obvious place where the Crows, *&c.* annoy your Corn; let it be about a foot deep, or more, and near two foot over, and ſtick long black Feathers of a *Crow*, or other Fowl, round the edges thereof, and ſome alſo in the bottom. Several of theſe holes may be made, if your ground be large; and where theſe holes are thus dreſſed, the Crows will not dare to feed. I preſume the reaſon is, becauſe whileſt they are feeding on the ground, the terrifying Object is out of their ſight; which is not uſual in other Scare-crows, wherewith in a little time they grow familiar, by being always in view.

Dead Crows, *&c.* hang'd up, do much terrifie them; but amongſt Cherry-trees, and other Fruits which are much prejudiced by the Crows, *&c.* draw a Pack-thred or ſmall Line from Tree to Tree, and faſten here and there a black Feather, and it is ſufficient.

Pigeons. Theſe Fowl that bring ſo great an advantage to one, prove a far greater annoyance and devourer of Grain to all the reſt of the Neighbourhood. It is an unknown quantity of Wheat, Barley, Peaſe, *&c.* that theſe devour; not to mention the Prodigious computation that ſome have made of the damage committed by them on the *Corn*, *Grain*, *&c.* yet is it moſt evident, that they deſtroy a great part of the *Seed* and *Crop*, notwithſtanding ſeveral ſtand for their vindication, alledging that they never ſcrape, and therefore take only the Grain that lies on the ſurface of the Earth, that would otherwiſe be deſtroyed, and not grow. To which I anſwer, That that very Corn that lies on the Surface may prove the beſt Corn, unleſs (in Winter-corn) the extream Froſts deſtroy it, or (in the Spring) the extream Drought: It having been of late found to be a piece of very good *Husbandry* in ſome light and ſhallow Lands, firſt to Plough it about *Auguſt*, and then to run the Fold over it, and well ſettle it, and afterwards to ſow and harrow it; which muſt needs make well for the Pigeons, and ill for the Husbandman, where they cannot be kept from it.

Alſo it is to be obſerved, that where the flight of Pigeons fall, there they fill themſelves and away, and return again where they firſt roſe; and ſo proceed over a whole piece of ground, if they like it. Although you cannot obſerve any Grain above the ground, they know how to finde it. As I have ſeen the experience of it, that a Piece of about two or three Acres being ſown with Peaſe, the Pigeons lay ſo much upon it, that they devoured at leaſt three parts in four of it; which I am ſure could not be all above the Surface of the ground. That their Smelling is their principal Director, I have alſo obſerved, having ſown a ſmall Plat of Peaſe in my Garden, (near a *Pigeon-houſe*) and very well covered them, that not a Peaſe appeared above ground. In a few days a parcel of Pigeons were hard at work in diſcovering this hidden Treaſure; and in a few days, of about two quarts, I had not above two or three Peaſe left; for what they

could not finde before, they found when the Buds appeared, notwithstanding they were howed in, and well covered; their Smelling only directed them, as I supposed, because they followed the Ranges exactly.

The injury they do at Harvest on the Pease, Fetches, *&c.* I hope none can excuse: therefore may we esteem these amongst the greatest Enemies the poor Husbandman meets withal; and the greater, because he may not erect a *Pigeon-house* also to have a share of his own spoils, none but the Rich being permitted so great a priviledge; and also so severe a Law being made to protect these Winged Thieves, that a man cannot *sumo defendendo* encounter with them.

You have therefore no remedy against them, but to affright them away by noises, or suchlike. Also you may shoot at them, so that you kill them not; or you may (if you can) take them in a Net, cut off their Tails, and let them go, by which means you will impound them; for when they are in their houses, they cannot bolt or flie out of the tops of their houses, but by the strength of their Tails; which when they are weakned, they remain Prisoners at home.

The *Jay* proves a great devourer of Beans, Cherries, and other Garden-fruits, and is also a subtil Bird; but is easily met withal, if you are watchful in a morning early, and have a good Ambush, which you must change sometimes, lest they discover you: They make but short flights, as it were from Tree to Tree, that you may easily pursue them. *Jays.*

A very good way to take them, is to drive a Stake into the ground, about four foot high above the Surface of the Earth: but the Stake be made picked at the top, that a *Jay* may not settle on it; then within a foot or thereabouts of the top, let there be a hole bored through, about three quarters of an inch Diameter; fit a Pin or Stick to the hole, about six or eight inches long; then make a Loop or Spring of Horse-hair fastened to a Stick or Wand of Hasel, that may be entered into the Stake at a hole near the ground, and by the bending of the Stick put the Loop of Horse-hair through the upper hole, and put the short Stick a little way into the hole, and lay the Loop round on the short Stick, that the *Jay*, when he comes, finding this resting place to stand conveniently amongst his food, perches on the short Stick; which immediately by his weight falls, and gives the Spring the advantage of holding the *Jay* by the legs. This is an undoubted way of taking them, if they are placed amongst the Beans, or suchlike where the *Jays* haunt, it being their usual custom to hop from Tree to Tree, or any thing they can meet withal.

These are most pernicious Birds to young Fruit-trees, by feeding on the young pregnant Buds in the Spring-time, which contain the Blossoms, and are the only hope of the succeeding Year. *Bull finches.*

They are easily taken off with a small Fowling-piece, only you

you must be cautious that your ſhot ſpoil not the Young Cions or branches of your Trees.

This Bird is ſo bold, or rather confident, that no Scare-crow, or other thing, will frighten him from the Trees he delights to feed on: But on the *Morocco-Plum*, or the *Damſon*, notwithſtanding all you can do, he will ſettle and feed: So that your beſt way to preſerve thoſe Buds, is to Bird-lime the Twigs.

Gold-finches. These Birds are alſo very injurious to the Goosberry-buds, coming in Flights, and cleanſing a whole Garden of them immediately; as the *Bull-finch* will the Buds of the Curran-tree. The remedies againſt them are the ſame with the other.

The *Chaffinch*, *Green-finch*, *Titmouſe*, and other ſmall Birds, are injurious to ſome Fruits; but not like unto the other before-mentioned, who will prey on the Buds of all ſorts of Fruit-trees, under the very Nets that cover the Trees, and near unto the dead bodies that hang on the Trees, and kill'd but a little before.

Sparrows. These, although they are but ſmall, yet are they a numerous Generation of Corn-eaters: It is unknown how much they devour in this Kingdom, and what a great damage it proves to the Husbandman, eſpecially in ſcarce and dear Years.

Many ways are made uſe of to deſtroy them, but none more effectual than the large *Folding Sparrow-net*, which will take many dozen at a Draught, they being ſo eaſily induced to come to a *Shrape* or place baited for them; eſpecially in the hard Weather in the Winter, and in the Summer before the Corn is ready for them: at both which times Meat is ſcarce abroad; and then they flock to Barns.

More, as to the deſtroying of Fowl, you ſhall finde hereafter in the Chapter of Fowling and Fiſhing.

SECT. V.

Of Inſects, and Creeping Things offending.

Frogs and Toads. Moiſt and warm Lands, which are uſually the moſt fertile, bare moſt ſubject to theſe Vermine. *Frogs* are beſt deſtroyed and prevented in *February*, in the Ditches where they Spawn, by deſtroying both *Frogs* and *Spawn*. *Toads* are eaſily diſcovered in the Summer-evenings (by a Candle) creeping up and down the Walks and Paſſages about your Houſe, Garden, *&c.*

Snails and Worms. To *Wall-fruit*, and ſeveral ſorts of *Garden-plants*, there cannot be a more pernicious Enemy than *Snails*, which you may in a Dewy Morning eaſily finde where they moſt delight to feed; but the ſureſt way is in the hard Winter to ſeek out their haunts, and make a clean riddance of them: They lie much in the holes of Walls, behinde old Trees, under Thorn, or other old and cloſe Hedges. In one Year I cauſed near two Buſhels to be gathered in a Winter in a Noble-mans Garden, which had in precedent years deſtroyed the moſt of their *Wall-fruit*, and ever after they had great plenty of Fruit.

Ever

Ever obſerve, not to pluck off ſuch Fruit the Snails have begun to feed on, but let it remain; for they will make an end of that before they begin on more.

The beſt way to take Snails, is to ſet Tile, Brick or Board, hollow againſt a Wall, Pale, or otherwiſe; ſo that the Snails may ſeek ſhelter under them: Then about *Michaelmas* the Snails ſecure themſelves in ſuch places for the whole Winter, unleſs you prevent them, by taking them in *December* and deſtroying them; which is an eaſie and ſure way to rid your Garden of them.

Worms may be picked up clean by a Candle in a moiſt Evening: if any eſcape you, another Evening may ſerve to finde them.

Your Beds watred with any ſtrong *Lixivium* made of the *Aſhes* or fixed *Salts* of any *Vegetable*, will not only deſtroy Worms, but prove an extraordinary improvement and inriching of the ground.

Lay *Aſhes* or *Lime* about any Plant you deſire to preſerve from *Snails* or *Worms*, and they will not come near it, becauſe the hot and biting nature thereof hurt their naked and tender bodies: therefore as the Rain or other Moiſture weakens, the *Aſhes* or *Lime* renew it, leſt it prove uſeleſs.

Rarely do theſe offend in the *Fields*, *Orchards* or *Gardens*, yet are they very troubleſome *Gueſts* in the Houſe, where it ſtands near any *Fens*, *Waters*, or ſuchlike places, tending much to the Generation of *Inſects*. *Gnats and Flies.*

To keep the *Windows* of your *Chambers* cloſe in the Summer-time, eſpecially towards the Evening, is a good prevention.

To burn Straw, and ſuchlike, up and down in the Chamber, in the Evening before you go to Bed, will deſtroy them; for either they will fly to the Flame, and be conſumed, or elſe the Smoak will choak them.

Aſhen-leaves hanged up in the Room, will attract them unto it, that you will be the leſs troubled with them.

The Balls of Horſe-dung laid in the Room will do the ſame, if they are new.

These uſually prove very injurious to ſome ſorts of Fruits; to *Bees*, *&c.* and are ſeveral ways deſtroyed. Firſt, *Waſps and Hornets.*

By way of prevention; that is, in the *Spring* or *Summer*, before they have encreaſed, to deſtroy the old ones; for from a few do they encreaſe to a multitude.

Or you may ſmoak or ſtifle them, if they are in any hollow Tree; or ſcald them if in Thatch of an Houſe or Barn, *&c.* or in the ground you may either ſcald or burn them, or ſtamp in the Earth on them, and bury them.

To deſtroy ſuch as come to your *Fruit*, *Bees*, &c. ſet by them *Sider*, *Verjuice*, ſowre *Drink* or *Grounds*, in a ſhort-necked Vial open, wherein you may catch many.

Alſo you may lay for them *Sweet Apples*, *Pears*, *Beaſts Liver*, or other Fleſh, or any thing that they love, in ſeveral places; upon

upon which you ſhall have ſometimes as many as will cover the Bait, which you may kill at once.

Caterpillars. We term thoſe *Caterpillars* that deſtroy the leaves of our *Trees* in the Summer, devour *Cabbages*, and other Garden-tillage, and are generally the effects of great Droughts.

To prevent their numerous encreaſe on Trees, gather them off in the Winter, taking away the *Puckets* which cleave about the branches, and burning them.

In the Summer, whileſt they are yet young, when either through the coldneſs of the night, or ſome humidity, they are aſſembled together on heaps, you may take them and deſtroy them.

Earwigs. Theſe in ſome years prove injurious to Fruits, by the greatneſs of their numbers feeding on and devouring them.

And are deſtroyed by placing *Hoofs* or *Horns* of Beaſts amongſt your Trees and Wall-fruit, into which they will reſort. Early in the morning you muſt take them gently, but ſpeedily off, and ſhake them into a Veſſel of ſcalding water.

Lice. By reaſon of great Drought, many ſorts of Trees and Plants are ſubject to *Lice:* and ſeeing that they are cauſed by Heat and Drought, as is evident in the *Sweet-bryar* and *Gooſeberry*, that are only Lowſie in dry times, or in very hot and dry places; therefore frequent waſhing them, by daſhing water on them, may prove the beſt remedy.

Ants. *Ants* or *Piſmires* are injurious to a Garden, and alſo to Paſture-lands, as well by feeding on Fruits, as by caſting up Hills, *&c.*

To keep them from your Trees, incompaſs the Stem four fingers breadth, with a Circle or Rowl of Wooll newly plucked from a Sheeps Belly.

Or anoynt the Stem with Tar.

Alſo you may make Boxes of *Cards* or *Paſtboard* pierced full of holes with a Bodkin, into which Boxes put the Powder of *Arſenick* mingled with a little *Honey*; hang theſe Boxes on the Tree, and they will certainly deſtroy them: Make not the holes ſo large that a Bee may not enter, leſt it deſtroy them.

Alſo you may hang a Glaſs-bottle in the Tree with a little *Honey* in it, or moiſtned with any ſweet *Liquor*, and it will attract the Ants, which you may ſtop and waſh out with hot water; then prepare it as before.

Watering often of Allies or green Walks, will drive away or deſtroy the Ants that annoy them.

To deſtroy Ant-hills. Ant-hills prove a very great injury to Meadows and Paſture-lands, not only by the waſting of ſo much Land as they cover, but by hindering the *Sythe*, and yielding a poor hungry food, and pernicious to Cattle.

And may be thus eaſily deſtroyed: Pare the Turf off, beginning at the top, and cutting it down into four or five parts, and lay it open: then cut out the Core below the ſurface, ſo deep, that when you lay down the Turfs in their places as they were taken

ken up, the place may be lower than the other ground, to the end that water may ſtand in it to prevent the *Ant* from returning, which otherwiſe ſhe will aſſuredly do; then ſpread the Earth you take out thinly abroad. Alſo the proper ſeaſon for this is in the Winter; and if the places be left open for a certain time, the Rain and Froſt upon it will help to deſtroy the remaining *Ants*: but be ſure to cover them up time enough, that the Rains may ſettle the Turfs before the *Spring*.

The greateſt injury theſe Vermine do us, is in biting Children, Cattle, *&c.* *Snakes and Adders.*

They affect Milk above any thing; and, as old Authors ſay, abominate the Aſh: there may you uſe the one by placing of it hot in any place where they frequent, to attract them, where you may deſtroy them and the other, by laying *Aſhen-ſticks* in places where you would not have them come. But this of the *Aſh* is not to be credited.

But the moſt proper remedy againſt theſe Vermine, is to keep *Peacocks*, which prey upon them.

Their *Sting* or *Bite* is moſt eaſily cured, if you timely apply a hot Iron to it, holding it ſo near as you are able to abide it: And it is by ſome Ingenious Perſons confidently affirmed, that it will attract the Venom totally from the Wound. *To cure the Stinging of Adders, or Biting of Snakes.*

Travellers relate, that in the *Canaries* the Natives cure the biting of a very Venomous Creature (that lurks amongſt the Grapes, and uſually bites them by the Fingers) by a ſtreight Ligature below the Wound; and holding the Finger bitten upright, for ſome time, out of which the Venom aſcends, it being of a Fiery Nature, naturally tending upwards, and may therefore be attracted by Fire, it's like.

SECT. VI.

Of ſome certain Diſeaſes in Animals and Vegetables.

There are ſeveral Epidemical and deſtructive Diſeaſes to Cattle, Fowl, *&c.* which ſweep away a great part of the Husbandmans Stock before it ceaſeth, or he know how to prevent it; which is eſteemed a great deficiency, that thoſe ways that ſome have diſcovered, and found effectual to prevent, and alſo to cure ſuch Diſeaſes, are not made publick; the general Stock of the Kingdom may as well be preſerved, as ſome few Cattle, in ſuch general Diſtempers; it being not our intent in this Book to ſay any thing of common Diſeaſes of Beaſts or Fowl, becauſe that Subject is ſo compleatly handled by ſeveral others, and is not abſolutely neceſſary for our Husbandman to know, there being almoſt in every place Profeſſors and Practiſers of that Art, and that have Materials and Inſtruments for that purpoſe: yet for that I meet with ſome general and eaſily-practicable Inſtructions, perhaps not familiar with *Country Farriers*, or *Horſe-Diſſars*, I ſhall a little digreſs. *Of Beaſts and Fowl.*

Of the Murrain.

This Diſeaſe is principally cauſed from a hot and dry ſeaſon of the Year, or rather from ſome general putrefaction of the *Air*, and begetteth an inflammation of the blood, and cauſeth a ſwelling in the throat, which in little time ſuffocateth the Cattle. Alſo the letting dead Cattle lie unburied; which Putrifying may cauſe a general Infection to that ſort of Cattle, as the Learned *Van-Helmont* obſerves, that theſe Infectious Diſtempers go no farther than their own kinde.

Therefore to prevent this Diſeaſe, let them ſtand cool in Summer, and to have abundance of good water, and ſpeedily to bury all Carrion.

And if any of your Cattle be already infected, ſpeedily let them blood, and give them a good Drench, *&c.* By which means divers have preſerved their Cattle, when their Neighbours have periſhed.

Of the Rot in Sheep.

In moiſt Years Sheep are ſubject to the Rot in the ſame grounds, where in drier Years they are not, and that not only from the moiſture, for then would Sheep Rot in all moiſt grounds, in dry Years as well as in wet; but from a certain Putrefaction both in the Air, and in the Graſs or Herbs that uſually attends them in ſuch moiſt years; which together with their moiſt Food, doth corrupt their Livers, and bring this Diſeaſe.

The cure whereof is difficult, unleſs it be done betime before the Liver be too much waſted: The removal of them to the *Salt Marſhes*, where they may be had, is a good remedy.

If *May* and *June* prove wet Moneths, it cauſes a Frimmand frothy Graſs, which together with the bad Air that muſt neceſſarily follow, cauſes the Rot in Sheep: therefore in ſuch Summers keep your Sheep on the dry and barren Lands, and fodder them in Winter with the hardeſt Hay, or moſt Aſtringent Fodder.

Some grounds yield a ſoft Graſs, more than other ſubject to breed the Rot in the Sheep: therefore feed other Cattle there, and your Sheep in the drieſt, hardeſt, and healthieſt Paſtures.

If your Sheep be infected with the Rot, which you may diſcern by the colour of their Eyes; ſome preſcribe to Pen them up in a Barn, or large Sheep-coat, ſet about with wooden Troughs, and therein feed them with Oats a day or two: then put amongſt them ſome Bay-ſalt well ſtamped, and after that a greater quantity, till ſuch time as they begin to diſtaſte it; then give them clean Oats another day or two, and afterward ſerve them with Salt as before. This courſe being followed until their Eyes have recovered their Natural colour, they will then be perfectly cured. Where you have not a Houſe convenient, it may be done open; the ſaving of their Dung (as before we directed) will anſwer the greateſt part of your expences.

Chap. 5.

Folding of Sheep in *May* or *June*, if they prove wet, makes them Rot the ſooner, becauſe they more greedily devour the

hurtful Graſs in the Morning, than thoſe not folded; therefore liberty from the Fold at that time is a good prevention.

An Approved Experiment for the Cure of the Faſhions in Horſes, and the Rot in Sheep.

Steep the *Regulus* of *Antimony* in *Ale*, with a little of the Spice called *Grains*, and a little Sugar; which give to a Horſe about half a Pint at a time, two or three times, with a day or two's intermiſſion between each time; to a Sheep about two or three ounces after the ſame manner. The ſame, or the following Receipt, may be alſo given to Swine for the *Meaſles*, *&c.* and to make them fat.

Give him half a dram of crude *Antimony* in his Meat, it will make him have a good ſtomack; and it will likewiſe cure him of all foulneſs of his Liver, and of the Meaſles. The ſame is alſo Soveraign for any other Beaſts. *For Swine.*

Trees and *Plants*, and other Inanimate things, are ſubject unto Diſeaſes that deprive them of, and abate their excellency, worth and duration, as well as living Creatures; and it doth as well require the care, and induſtry, and skill of the Husbandman to inſpect into their Nature, and make uſe of ſuch means as are requiſite, as well to prevent, as cure ſuch Diſeaſes. *Of Trees and Plants.*

The *Canker*, *Moſs*, *Bark-bound*, and *Worms* in Trees, prove very pernicious: Their Cures we have already diſcourſed of. *Chap. 7.*

The *Jaundies*, or *Langor* of Trees, makes them ſeem to repine, and their Leaves to fall off or wither, and proceeds from ſome hurt done to their Roots, either by *Moles* or *Mice*, or by the ſtroak of ſome Spade, or by the Tree ſtanding too moiſt or low: according as you finde the Diſeaſe, ſo muſt you make uſe of a remedy, either by ſearching the Root; and if you finde any wound or gall, to cut it off a little above ſuch wound, and lay ſome Soot there to keep Vermine off, if the injury came from them; or if water offends, either divert the water, or remove the Tree: If it be planted too deep, it is better to raiſe it, than let it ſtand where you may be confident it will never thrive.

The general Diſeaſes of *Trees*, and impediments to their thriving, are, either they ſtand too deep, too dry, too cold, too moiſt, too much in the winde, *&c.* according to the divers Nature and diſpoſition of the Tree.

Therefore if you expect that a Tree ſhould thrive, obſerve his Nature, and in what place it moſt delights; which the ſixth and ſeventh Chapters of this Book, treating of *Woods* and *Fruit-trees*, will ſufficiently direct.

SECT. VII.

Of Thieves and Ill Neighbours.

There is no more conſtant, certain, and pernicious Enemy to the Husbandmans Thrift, than Man himſelf; *Homo homini Dæmon:* they rob and ſteal from, oppreſs, maligne, injure, perſecute, and devour one another, to the decay of *Arts* and *Sciences*, and even to the ruine of whole Families of Ingenious and Induſtrious men; every one ſtriving to build up his houſe, and raiſe his Family by the ruines and decay of his Neighbours. But our only Complaint is againſt the common and ordinary ſort of vile perſons, that live after a moſt ſordid manner, and ſeek not Wealth nor Greatneſs, but only to maintain themſelves in a moſt deſpicable lazy kinde of life, by filching and ſtealing from their honeſt and laborious Neighbours; and againſt ſuch, that though they ſteal not, yet oppreſs, oppugne, and injure thoſe that are more Induſtrious than themſelves.

Againſt Thieves. The ſevere penalty of death being the puniſhment for Theft, is the principal cauſe of the infinite encreaſe of Thieves: Firſt, becauſe many there are, who (if they know or have taken a Thief) will not Indict nor Proſecute him, becauſe their Conſcience will not admit of inflicting ſo ſevere a puniſhment for ſo ſmall an offence, but will rather bear the loſs of their Goods, than ſeek another mans life for it.

Secondly, Some, if they take a Thief, will rather accept of their Goods again, and Satisfaction, than proſecute him; becauſe in ſome caſes they looſe their Goods, and are alſo at the charge of Proſecution.

Thirdly, Some alſo will not Proſecute common ordinary Thieves that live by ſtealing *Sheep*, *Corn*, *Wood*, *Poultry*, *Swine*, *&c.* and have Families to maintain by this very Trade, leſt they (being part of the Pariſh) be bound afterwards to maintain their Families. And thus are the conditions of many places in *England*.

Fourthly, When Thieves are taken and proſecuted, and come to their Tryal; they being for their Lives, no Evidence will, nor ought to be taken, but what is very clear: And where it is ſo againſt one, either through miſtakes, or wilful omiſſions, it is deficient againſt five; by which means moſt of thoſe few that come to Tryal are found *Not Guilty*.

Fifthly, When they are upon Tryal, and the Evidence clear againſt them, either the Jury are tender of their Neighbours life, or elſe ſome good Friend or other appears, that it is found but *Petit Larceny*; or elſe the Thief has his Clergy, or by ſome ſuch Shift, or Means, or Evaſion, he gets off: So that it may be, as it often happens, a Thief comes five or ſix times to his Tryal, or at leaſt to Goal, before he is hanged: During which time he grows more ſubtil, and Educates many other in the ſame Profeſ-

ſion,

ſion, and teacheth them all manner of Tricks and Devices, not only to effect their intentions, but to avoid the Puniſhment.

To remedy which, were to make the Penalty more moderate, and without reſpect or favour to be aſſuredly executed; it would much leſſen their number.

As ſuppoſe the Penalty of all manner of Theft were, to be Tranſported to the *Weſt-Indies*, or to be confined to ſome certain *Mines*, or ſuchlike, at the pleaſure of the *Judge*; and to have an apparent Brand or Mark in the Face; and that it ſhould be free and lawful for any man to kill any ſuch perſon returning or ſtraying from ſuch imployment; and that every one that loſt their Goods, and did proſecute the Thief, ſhould have their Damages and Coſts reſtored: I ſuppoſe none would make any ſcruple of Proſecution, nor would any endeavour to preſerve theſe *Vipers* from ſo moderate, yet ſufficient puniſhment.

This way, if ſeverely proſecuted, without favour or reſpect, would in a little time rid the Country of the Old Thieves, and their very Breed alſo, that there would ſcarce be any of their Blood remaining: But if any ſhould by chance appear, he would hardly have any time to learn his Trade perfectly.

But until ſome ſuch Law be eſtabliſhed, which we humbly leave unto our *Grand Patriots* to conſider of, on whom we *Ruſticks* depend for good and wholeſome Laws to preſerve our Intereſts; which will the better capacitate us to ſerve his Majeſty, and anſwer his Occaſions with our Fortunes, as well as with our Lives: and will alſo the better enable us to pay our Rents unto them, and improve their and the whole Kingdoms Revenues.

In the mean time (I ſay) let us endeavour the preſervation of our Goods from theſe Vermine and Children of Darkneſs, by ſuch means, and by what Induſtry we are capable of, as by diligent and careful watching; *Quæ enim res quotidie videntur, minus metuunt furem*; by making good and ſecure Fences, and by having our Doors, Walls and Windows of our Houſes, Barns, Stables, Gardens, *&c.* well fortified againſt them. Varro.

We ſhall not here contend with any, whether the Rules of *Aſtrology* to diſcover Theft, the making or laying of *Charms*, *Spells*, or *Sigils* to prevent Theft, or the Art of inforcing the Thieves to bring back Goods ſtoln, be lawful or not: *Quæ ſupra nos, nihil ad nos.*

But if I know the certain or probable haunt or way the Thief uſeth, I may ſafely make uſe of ſome Gin or Snare to keep him by the Legs, or otherwiſe, till I come and releaſe him; or I may place certain ſharp Spikes of Iron in the ground, and ſtrain ſome pieces of ſmall Braſs-Wire athwart the way near the ground, on either ſide of the ſharp Spikes, (which Wire and Spikes are not viſible by night) that when Mr. *Thief* walks and thinks not of it, by ſtumbling at the Wire, he falls on the Spikes; which give him ſuch marks, that you may perhaps know him againſt another day.

Or

Or you may run Wires acroſs your Back-ſide, the ends whereof may be faſtened to ſome Lock of a Piſtol, or ſuchlike, that by the touch only of the Wire the Piſtol may be diſcharged, which will give you notice, and alſo terrifie the Thief; and may be ſo placed, that it may ſhoot directly towards him.

Or you may have a Bell to Ring, only by the touch of ſuch a Wire, which may terrifie the Thief, and give you notice.

A good *Maſtiff* is a ſingular Preſervative to a Back-ſide againſt ſuch that are not of his Acquaintance, or that know not how to Charm him; which few Country-Thieves underſtand: but if he be kept within doors, he is a ſure defence againſt Burglary, and out of the Charmers power. The ſmall bawling Curs are the ſureſt Watchers, and are good to rouze up the *Maſtiffs*.

Ill Neighbours. An Ill Neighbour is a very great Evil, and a Good Neighbour as great a Happineſs, ſaid Old *Heſiod*.

What a grief, loſs, and inconvenience it is to be confined to dwell by Ill Neighbours? how it multiplies our cares, and increaſes our labours, and leſſens our Stocks and Profits? How are we diſquieted at the ſight of them? And how are our Fruits deſtroyed, and our Corn ſpoiled by them and their Cattle, who are continual Treſpaſſers? eſpecially if they think we are ſo peaceably given, as to put up ſmall injuries; or that we are unwilling to ſeek Remedies worſe than the Diſeaſe againſt theſe Enemies to our good Husbandry, and to our otherwiſe moſt happy life. We have no Remedy but Patience, the beſt of Vertues.

Yet ſome policy may be uſed to Charm theſe *Crocodils*, to make theſe Furies Friends: pleaſe a little their Natures, and feed their Humours in what they delight; by being their ſeeming-Friends you may commend them, and they will be as ready to ſerve you, as to proſecute another Neighbour that leſs deſerves, only becauſe he uſes not the ſame Method of policy. If they love their Bellies, invite them often; *Eum potiſſimum vocato, quicunque te prope habitat*; be ſure to pleaſe them that are moſt capable of doing you hurt: whatever they delight in, pleaſe them in it, and you have done enough, for you know not what need you may have of a Neighbours help; ſometimes may Thieves aſſault you, ſometimes you may want ſome particular Inſtrument that your Neighbour hath, without which, or whileſt you go farther, you ſuffer great loſs: And what a ſad thing it would be to be denied, as *Heſiod* in his time obſerved.

Streighten not your ſelf ſo, as to ask to borrow of another, leſt he refuſe, and you want.

CHAP.

CHAP. XI.

Of the ſeveral ſorts of Inſtruments, Tools and Engines incident to this Profeſſion of Agriculture; *and of ſome Amendments and Profitable Experiments in Building, either by Timber, Stone, Brick, or any other way.*

Dicendum, & quæ ſint duris Agreſtibus Arma; Virgil.
Queis ſine nec potuere ſeri, nec ſurgere Meſſes.

IT is impoſſible to go through the many difficulties in this Art, without many and ſeveral ſorts of Tools and Inſtruments, as Ploughs, Carts, *&c.* It is alſo difficult and unprofitable to make uſe of ſuch Ploughs, Tools and Inſtruments that are troubleſome, heavy and chargeable, when the ſame labour may be as well performed, if not better, with ſuch that are eaſie, light, and not ſo coſtly: Therefore I ſhall in this Chapter diſcover unto you all the ſeveral ſorts of Inſtruments neceſſary for the Husbandman, and what inconveniencies have been found in ſome of them; and the Remedies, and what new ways or Methods have been of late diſcovered to facilitate his labours, as I finde them diſperſed in ſeveral Authors, and have obſerved the ſame in ſeveral parts of this Kingdom; this Inſtrumental part of *Agriculture* being not of the leaſt concernment: And ſhall alſo diſcover unto you ſeveral profitable Experiments and Directions in Building, neceſſary to be known.

SECT. I.

Of the ſeveral ſorts of Ploughs.

And firſt I ſhall begin with the Plough, the moſt neceſſary Inſtrument, the chiefeſt of all Engines (as *Gabriel Plat* terms it) and happily found out.

There is a very great difference in Ploughs, that there is ſcarce any ſure Rule for the making of them; and every Country, yea almoſt every County differs, not only in the Ploughs, but even in every part of them.

Ploughs alſo do not only differ according to the ſeveral Cuſtoms of ſeveral places, but alſo as the Lands do differ in ſtrength or weakneſs, or the different Nature of the Soil.

To deſcribe them all, is not a work for this place; but I will give ſome brief Deſcriptions of the more principal ſorts of Ploughs

Double-wheeled Plough. Ploughs of the greateſt eſteem: And firſt of the *Double-wheeled Plough*, which is of moſt conſtant uſe in *Hartfordſhire*, and many other Countries, and is very uſeful upon all Flinty, Stony, or hard Gravel, or any other hard Land whatſoever: It's eſteemed a uſeful and neceſſary Plough. Theſe require a greater ſtrength than other Ploughs, and to be uſed in ſuch places where other Ploughs will not to any purpoſe. It is uſually drawn with Horſes or Oxen two abreaſt: the Wheels are uſually eighteen or twenty inches high; in ſome places the Furrow-wheel is of a larger circumference than the other that goes on the ſolid Land.

Engliſh Improver.

Turnwreſt-Plough. There is another ſort of *Double-wheeled Ploughs*, called the *Turnwreſt-Plough*, which ſurpaſſeth for Weight and Clumlineſs, and is called the *Kentiſh-Plough*, being there much uſed.

Single Wheel-Plough. The *One-wheel Plough* is an excellent good one, and you may uſe it on almoſt any ſort of Lands, and is of that ſhape and form that will admit of more lightneſs and nimbleneſs than the other *Wheel-ploughs*; being the ſame that Mr. *Hartlib* ſpeaks of to be made neat *Greenwich*, by one who had excellent Corn on barren Land, and yet Ploughed his Land with one Horſe.

Legacy.

Engliſh Improver. This Plough neatly made, and very ſmall, hath been drawn with one Horſe, and held by one Man, and ploughed one Acre a day at Sowing-time, in a moiſt ſeaſon. There hath been with ſix good Horſes, ſix Men, and ſix Ploughs, ploughed ſix Acres a day at Sowing-time, in light and well-wrought Land. This ſeems to accord with the Plough uſed in *Heſiod*'s time, where the Plough-man did both guide and drive.

Plain-Plough. There is a ſort of Plough made without either Wheel or Foot, deſcribed at large by Mr. *Blith*, to be the moſt eaſie going Plough, and of leaſt Workmanſhip, Burden or Charge, called the *Plain-plough*, fit for any Lands, unleſs in irregular extream Land, either for Stones, Roots, or Hardneſs; and there adviſeth to the *Double-wheeled Plough*, being of ſtrength to ſupply extremities and caſes of neceſſity.

Double Plough. Mr. *Blith* deſcribes a double Plough, the one affixed to the ſide of the other, that by the help of four Horſes and two Men you may Plough a double portion of Land, the one Furrow by the ſide of the other. This he eſteemeth not to be of any great advantage above the other plain Plough, yet may be of good uſe on ſome Lands.

Engliſh Improver.

Another ſort of Double-Plough. There is another ſort of Double-Plough much exceeding the other, as Mr. *Hartlib* in his *Legacy* teſtifies of an Ingenious Young Man of *Kent*, who had two Ploughs faſtened together very finely, by the which he ploughed two Furrows at once, one under another; and ſo ſtirred up the Land twelve or fourteen inches deep.

This is one of the beſt additions to the Plough, if throughly proſecuted; for moſt Land requires a deeper ſtirring than is ordinarily given it by the uſual way of Ploughing, as is evident by thoſe Experiments that have been made in digging and ſetting

of

of Corn. This way alſo comes near that of Digging, and in ſome caſes excels it, becauſe it only looſeneth and lightneth the Land to that depth, but doth not bury the upper-cruſt of the ground ſo deep as uſually is done by Digging. It is alſo much eaſier to Plough deep with this Double-Plough, than with the ſingle; becauſe it beareth not ſo great a burden, but the one part thereof is diſcharged before the other is taken up.

Other ſorts of Ploughs.

Some have made a Plough with a Harrow affixed thereto; others have deſigned a Plough, to Plough, Sow and Harrow all at the ſame time: But ſeeing they are of no great advantage to the Husbandman, only invented to ſatisfie the minds of ſome Scrutiniſts, I leave them.

Of all which ſeveral ſorts of Ploughs, there is great variation in the ſeveral parts of them; ſome differ in length and ſhape of the Beam, ſome in the Share, others in the Coulter, and in the Handles. The differences are ſo many, that no one Ploughman knoweth them all.

Errours of the Plough.

The Abuſes, Faults and Errours incident to the Plough, are many; ſome in the Workmen and Drivers, who when they are wedded to an old Erronious Cuſtom, though never ſo evidently diſcovered, will not recede from it; or in the Plough it ſelf, as when it is made too big and cumberſome, and diſproportioned, the one part too large or too little for the other; and when it is rough, and ill compaſſed in the Share; when the Handles are too ſhort or too upright, the Irons dull: And many other faults there are which greatly hinder the Husbandmans eaſe and advantage, and which ought to be remedied. And if you will have your Plough do you ſervice, and gain you advantage, it ought to have theſe ſeveral good properties, or as many of them as you can obtain.

Good properties of a Plough.

It ought to be well-proportionated for ſtrength, according to the nature or ſtrength of the ground you are to Plough; that the Irons be ſharped, and wear bright. Alſo the ſhorter and leſſer any Plough is made, having it's true Pitch, with it's true caſt on the *Shield-board*, and *ſhort Wreſt*, and *ſharp Irons*, the far eaſier.

What elſe is neceſſarily requiſite in the Plough, you may better finde by your Manual and Ocular Experience, than by all the inſtructions that can be here given, (as in *Plautus*) *Plurie eſt oculatus teſtis unus, quam auriti decem.* Yet if you are deſirous to read the large Deſcriptions of the ſeveral ſorts of *Ploughs* now in uſe, with all their diverſities of *Coulters*, *Shares*, *Shield-boards*, *Wreſts*, &c. I refer you to the *Engliſh Improver.*

A Turfing-Plough.

There may be other *Ploughs* made for ſeveral uſes not uſually known; as lightly to pare off the Turf of ſoarded Land, as they uſually do that moſt laborious way with the *Breaſt-plough*, to be burnt on heaps after it is turned and dried: This would ſave the greateſt part of the expence of Burn-beating, and be every whit as well, if not better.

I have heard of Ploughs drawn with Maſtiff Dogs; others

promiſe much of Ploughs driven by the Winde: but theſe I eſteem as fruitleſs to the Husbandman, and rather the Products of Superficial Ingenuity.

Concerning Ploughs or Inſtruments for the making the Furrow, ſowing the Corn, and covering of it with the ſame Plough; with the ſeveral other uſes of that and other Ploughs, you will finde diſcovered in their proper places. *Chap.* 4.

SECT. II.

Of Carts and Waggons.

There are ſeveral ſorts of *Waggons*, *Carts*, *&c.* ſome with four, ſome with two Wheels; and alſo for ſeveral uſes, either for the carrying of Timber, Corn, Dung, or ſuchlike; all differing the one from the other, according to the ſeveral places, whether hilly, level, ſtony or clayie, or to the ſeveral occaſions for which they are intended. In ſome places they are much more curious in the forming of them, making them neater, lighter and ſlenderer, as well in the Wheels, as in the other parts of the Cart or Waggon. The Wheels, the more upright or ſquare the Spokes are from the Box or Center, the weaker they are when they come to bear on either ſide: to that end they make them concave or diſhing, and alſo to ſecure the Wheel from breaking in a fall. The greater the circumference of the Wheel is, the eaſier is the motion, becauſe the Ring or Bond of the Wheel is the more flat, and doth more eaſily over-paſs any ſtones, or other obſtructions in the way, and ſinks not ſo eaſily into the Concavities or defective places of the Earth: Its motion is alſo ſlower at the Center; for the greater Wheel of eighteen feet in the circumference, goeth but once round in the ſame meaſure of ground where the leſſer Wheel of nine feet in the circumference goeth twice; and ſo according to the ſame Rule and proportion, where the difference is greater or leſſer: Therefore the leſſer the Wheels are of any *Cart*, *Waggon* or *Plough*, the heavier it goes, and more unevenly or jogging. The reaſon why the Fore-wheels are leſſer in a Waggon, is only for its conveniency in turning. *Contrary to the opinion of ſome.*

The higher a Cart or Waggon is ſet, the more apt it is for overturning: but becauſe the ſetting of it low, and the height of the Wheels, after the uſual way of placing them, cannot conſiſt together; therefore it may prove very commodious to place the Bed of the Cart under the Axle-tree, at ſuch diſtance as the depth or ſhallowneſs of the ways or waters you are to go through will bear; for by this means part of the weight will be under the Axle-tree, which will ſo far counterpoiſe what is above, that it will very much prevent the over-turning or overſetting the Cart or Waggon: For we evidently ſee, that the higher a Load lieth, whether it be Hay, Corn, Straw, *&c.* the eaſier it overſets; and the lower it lies, as ſtones, metals, *&c.* *New ſort of Carts.*

the more rarely, if you make the Tail of the Cart or Waggon turning upwards, I cannot perceive any inconvenience can ariſe from this way.

They are much more curious in making of them in ſome places, than in other; as in *Holland* they make them very neat and light; one Horſe ſhall effect as much with a ſlender, neat, and light *Cart* and *Wheels*, as two ſhall with a cumberſome heavy one.

In *China*, Waggons are made to paſs frequently with Sails, like Ships, (as Hiſtoriographers relate.) It's probable their Winds are more certain and conſtant, and their ways more level than they are here. In *Holland* a Waggon was lately framed, which with ordinary Sails carried thirty people ſixty Engliſh miles in four hours: I have ſeen much done of this nature, and more might be done, as to make a Cart or Waggon move againſt the winde; and the more the winde blows, the faſter it ſhall move againſt it, by the help of the Perpetual Skrew, *&c.* But theſe being not to our preſent purpoſe of advantage, I ſhall leave to others.

Waggon with Sails.

Hartlib's Legacy.

SECT. III.

Of ſeveral other Inſtruments uſed in Digging, &c.

The Trenching-plough or Coulter is a certain Inſtrument uſed in Meadow or Paſture-ground, to cut out the ſides of Trenches, Carriages or Drains; or it is uſed in cutting out the ſides of Turf, for the taking of it up whole, to the intent to lay it down again in the ſame or ſome other place: It is only a long ſtale or handle, with a Button at the end for ones hand, and at the other end it turns upwards, like the foot of a Plough, to ſlide on the ground; in which bend muſt be placed a Coulter or Knife of that length you intend the Turf to be in depth.

Of the Trenching Plough.

Several faſhions there are of them, ſome with one Wheel, ſome with two, ſome with none; you may make them as you pleaſe.

There are many ſorts of Spades, according to the diverſities of places, and the ſeveral occaſions and humours of men.

Of Spades.

One ſort is made very thin, light and ſharp, with a Socket to put the Stail in, like the Hedging-bill; the Bit very ſhort, and not very broad; in ſhape much like a Spade in Cards; of very great uſe to ſome (though hardly known to others) to under-cut the Turf after it is marked out with the Trenching-plough, which it doth with much eaſe and expedition.

Turfing-ſpade.

For the cutting Trenches in watery, clayie or Moriſh Lands, they uſually uſe a Spade, with a *Langet* or *Fin* like a knife, turned up by the ſide of the Spade; and ſometimes on both ſides, to divide the Clay or moiſt Earth, and cut the ſmall Roots that it come clean away.

Trenching-ſpade.

The ordinary Spade is made ſeveral ways; but the moſt commendable are the lighteſt and thinneſt wrought, not wanting their due ſtrength; the cleaner they are kept, the better they work.

Common ſpades.

The How. The How is an Inſtrument of very great uſe, and it is great pity it's no more uſed. If the ſpare-times of the year (except when the Earth is frozen) were but made uſe of to How the ſeveral creeks, corners, and patches of your Land, it would undoubtedly prove a very great Improvement. More hereof in their proper places. *Chap.* 4.

Other Inſtruments uſed in Digging, &c. Beſides the Spade and How, and their kinds, there are ſeveral other Inſtruments uſed by the Husbandman for the grubbing and raiſing of Trees both great and ſmall, and Buſhes, Brakes, *&c.* and for the making holes and paſſages in hard and ſtony Lands for ſeveral occaſions, and for the loading and ſpreading of Dung, Earth, *&c.*

As *Mattocks*, *Pick-axes*, or *Grubbing-axes*; and alſo the great Inſtrument deſcribed by Mr. *Platt*, for the quick riddance of Shrubs, Broom, and ſuchlike, mentioned before, *Chap.* 10. The *Iron-crow*, or *Iron-bar*, are not to be wanting: Alſo *Shovels*, the *Dung-fork*, *Mole-ſpades*, or *Paddle-ſtaffs*, you will ſometimes have occaſion for.

SECT. IV.

Other various Inſtruments.

He that goes a borrowing, goes a ſorrowing, is an old and true Proverb: Therefore it behoves our Husbandman that intends to thrive, to poſſeſs or furniſh himſelf with all things neceſſary, and of preſent neceſſity for his Occupation, that he may not put himſelf to the trouble of borrowing, nor the damage he is likely to ſuſtain for want of, nor the ſcorn or diſgrace of being denied any thing he wants.

That you may not be forgetful of any, or at leaſt of the moſt uſeful and neceſſary Inſtruments, beſides the fore-mentioned, I will enumerate ſuch as come into my minde, and adviſe you to add what you finde deficient, and let them be all placed in their proper places; according to *Xenophon*'s advice: *Supellex & Inſtrumenta varia Ruſtica, ſuo quæque loco & ordine diſpoſita, in promptu ſint quoties vel promenda vel requiſita ſeponenda ſunt.*

Belonging to the Arable and Field-land, are

Harrows.
Drags.
Forks.
Sickles.
Reap-hooks.
Weed-hooks.
Pinchforks.
Rakes.
Plough-ſtaff and Beetle.
Sleds.
Roller.
Mold-ſpears and Traps.
Cradle-ſythes.
Seed-lip.

To the Barn and Stable

Flails.
Ladders.
Winnowing-fan.
Meaſures for Corn.

Sieves

Sieves and Rudders.
Brooms.
Sacks.
Skeps or Scuttles.
Bins.
Pails.
Curry-combs.
Main-combs.
Whips.
Goads.
Harneys for Horses, and Yokes for Oxen.
Pannels.
Wanteys.
Pack-saddles.
Suffingles.
Cart-lines.
Skrein for Corn.

To Meadows and Pastures.

Sythes.
Rakes.
Pitchforks and Prongs.
Fetters, and Clogs, and Shackles.
Cutting-Spade for Hay-reeks.
Horse-locks.

Other necessary Instruments.

Hand-barrows.
Wheel-barrows.
Dibbles.
Hammer and Nails.
Pincers.
Sissers.
Bridle and Saddle.
Nail-piercers or Gimlets.
Hedging-hooks and Bills.
Garden-sheers.
A Grindstone.
Whetstones.
Hatchets and Axes.
Sawes.
Beetle and Wedges.
Leavers.
Shears for Sheep.
Trowels for House and Garden.
Hod and Tray.
Hog-yokes and Rings.
Marks for Beasts and Utensils.
Scales and Weights.
An Aul, and every other thing necessary.

SECT. V.

Of Amendments and Profitable Experiments in Building.

As the *Manners* and *Customs* of Men are in every Age refined, and tend more and more to Purity and Perfection in these *Northern* and formerly-rude and salvage Countries, or rather grow more exact, and imitate the other more *Southerly* and first civilized parts in *Language*, *Manners*, *Arts* and *Sciences*; so do they also endeavour to reform their most gross, undigested, and ill-contrived *Structures* and *Edifices*, not only in *Cities* and *Towns*, but in their Country-Villages also, that we now compare some of our *Cities* and *Towns* with most of theirs, and even excel them in several; and that not a few of our most suavious and delectable *Rural Seats*, as well for their *Magnificent*, *Regular*, and *Artificial Structures*, and most ingenious contrivances, as in their most salubrious, convenient, and pleasant *Situations*.

And for the future, were but the Rules of *Architecture* duly observed, and those new and compleat Methods and Models contrived for Building, and the Situations of places, according to the best judgments taken notice of in such Buildings that may

may hereafter be raiſed, either *de Novo*, or in the reſtoring or re-edifying of our ancient and decayed Seats in our Country-Villages, our *England* in a few Ages would appear a Kingdom beſet and adorned in every part with curious and admirable Habitations, poſſeſſed with Noble and Ingenious Inhabitants; and would at large repreſent to the view of all, what *Middleſex* it's *Epitome* now doth; and would contract the envy of other Nations, as the Land of *Canaan* formerly did.

Therefore let me adviſe all ſuch that are willing or neceſſitated to Build, that they ſit down and conſider of the manner and Method of Building, as well as of the charge and expence; and that they will make choiſe of ſuch Surveyors and Workmen that underſtand what they go about, and not be guided or perſwaded by ſuch that are wedded to an old deformed Cuſtom, who will in no wiſe conſent to a more compleat way, although it be much more Beautiful and Regular, and alſo with leſs materials, and cheaper, and more convenient than the other, for no other reaſon but that it is a Novel, and not as our Forefathers did before us, yet perhaps are willing to beſtow expence enough upon it in inriching it, although but with little skill or Art. But I ſuppoſe it is better to erect that which will be pleaſing to, and content both Wiſe-men and Fools, then that though done by the ſame coſt and expence, which will only pleaſe Fools.

This is a digreſſion from our intended deſign, and here inſerted only to perſwade ſuch that intend any ſtore of Building, to make uſe of ſuch Authors and perſons that underſtand that Art, which in this place we do not undertake to teach, only ſhall give the Husbandman a few general Rules and Directions that I have caſually met withal, about the ſcituation and building of a plain Country-ſeat, and the building of Walls, Barns, Mills, *&c.*

Prædium Ruſticum bonum Cœlum habeat, &c.

The ſcituation of a Houſe.

Let your Country-houſe have a good Air, and not open to Tempeſts, ſeated in a good Soil; let it therein excel, if you can; let it ſtand under a hill, and behold the South, *in a healthy place; let there be no want of Workmen or Labourers; let there be good water, and let it ſtand near ſome City or Market-Town, or the Sea, or ſome Navigable River, or have a good Road or way from it.* Thus *Cato* adviſes.

Little more can be ſaid, but that Woods alſo as well as water may be near it, they being the principal things that adorn a Country Habitation: But if you cannot conveniently ſeat your Houſe amongſt the Trees, yet are there few places but you may raiſe ſpeedily Trees about your Houſe, as before we directed; it being far better to have your Houſe defended by Trees than Hills; for theſe yield a cooling, refreſhing, ſweet and healthy Air and Shade, during the heat of Summer, and very much break the cold winds and Tempeſts from every Coaſt in the Winter.

Chap. 6.

Winter. The other, according as they are ſcituated, defend only from ſome certain winds; and if they are on the *North*-ſide of your Houſe, as they defend you from that Air in the Winter, ſo do they deprive you of it in the Summer; if they are on the *South*-ſide, it otherwiſe proves as inconvenient. Beſides, they yield not the pleaſures and contentments, nor the varieties of Obſervations to the Ingenious Ruſtick, as the tall plumps of Trees and pleaſant Groves do; yet are Hills cloathed with Coppices, or otherwiſe improved, pleaſant objects, ſo that they ſtand not too near your Houſe.

Let not your Houſe be too low ſeated, leſt you looſe the conveniency of Cellars: but if you cannot but build on low grounds, ſet the lower Floor of your Houſe the higher, to ſupply the want in your Cellar of what you cannot ſink in the ground; for in ſuch low and moiſt grounds, it conduceth much to the drineſs and healthineſs of the Air, to have Cellars under the Houſe, ſo that the Floors be good and ſieled underneath.

It is very inconvenient to build Barns, Stables, or ſuchlike places too near to your Houſe, becauſe Cattle, Poultry, and ſuchlike, require to be kept near them; which would then annoy your Houſe. Let your Garden joyn to one, if not more ſides of your Houſe; for what can be more pleaſant for the moſt part of the year, than to look out at the Windows of your Parler and Chambers into a Garden? What ſides of your Houſe are not joyning to your Garden, let there be Courts or Yards kept from Cattle, Poultry, *&c.* and planted with Trees, to ſhade, defend, and refreſh your Houſe; and the Walls alſo planted with Vines, and other Fruits.

Securest and cheapest way of Building a Houſe.

Not to ſpeak of the building of Palaces or Seats for the *Nobility* or *Gentry*, but only of plain and ordinary Farm-houſes, I have thus much obſerved, that Houſes built too high in places obvious to the winds, and not well defended by Hills or Trees, require more materials to build them, and more alſo of reparations to maintain them; and are not ſo commodious to the Inhabitants, as the lower-built Houſes, which may be made at a much eaſier rate, and alſo as compleat and beautiful as the other. In building of a Houſe long, you looſe the uſe of ſome Rooms, and it takes up more for Entries and Paſſages, and requires more doors: and if it be four-ſquare, there muſt needs be light wanting in ſome part thereof, more than if it be built like an H, or ſome other ſuchlike Figure; which maketh it ſtand better and firmer againſt the winds, and Light and Air come every way to it; every Room is near the one to the other. The Offices, as the Kitchin, Dairy-rooms, Brewing and Baking-rooms, are near unto the Hall, which only divides between thoſe and the Parlor, *&c.* Several Deſcriptions and Draughts of Foundations could I give you here, were not the cutting of them too coſtly for ſo Ruſtick a work to bear. The Walls, where Brick may be had, are beſt and moſt ſecurely raiſed with it, and with little coſt, if your raiſe firm and ſtrong Columns at the corners of your

House,

House, of strength sufficient to support the Roof or main Beams: you may build them square, and between them may you raise the Walls with the same materials, and work them up together with the *Corners* or *Columns*, leaving the one half of the extraordinary breadth of the *Column* without, and the other within the Wall; whereby you will save much cost and charges both in materials and workmanship, and yet your house be firm and strong.

Best covering for a House.

The heavier any Covering is to a House, the greater is the expence in raising the whole Frame or Building to support it, and the sooner doth it require reparations; therefore healing with Lead or flat Stone is not to be approved of, by reason of its weight, where Earthen Tile, Slate, or Shingle may be had: Next unto Lead or Stone, Tiles made of Clay are the heaviest, and most in use.

Pantiles, such as come from *Holland*, are the best and lightest covering of any sort of Tiles; and it is to be admired at, that another Nation can transport so Earthy a Commodity, and pay all duties, *&c.* and sell them at our own doors at a cheaper rate than we can make them; and yet have we as good materials, and Fuel more plentiful than they.

Of Tiles, Bricks, &c.

A Composition of Clay, Sand, *&c.* is easily made for Tiles, that shall make them not only thinner and lighter, but also stronger and more durable, if Ingenious men would undertake it; which are rare to be found in so dirty, yet necessary an Occupation; which would save very much charge and materials in Building, if it were truly prosecuted.

The same may be said of Bricks, *&c.* and with such a Composition may be made in Molds, all Window-frames for a House of different work and magnitudes, and Chimney-pieces, and Frames for doors, *&c.* in several pieces made in Molds, that when they are burnt, may be set together with a fine red Cement, and seem to be as one entire piece; whereby may be imitated all Stone-work now used in Building, and it will very well supply its defect where Stones are scarce and dear; and also may save very much Timber which is now used in Brick-building, and appear much more compleat and beautiful, and be of more strength and of longer continuance than Timber or ordinary Brick, and is very feasible; as we may perceive by the Earthen-pipes made fine, thin and durable, to carry water under the ground at *Portsmouth*; and by the Earthen-backs and Grates for Chimneys, made by Sir *John Winter* formerly at *Charing-Cross*, of a great bigness and thickness; which are evident and sufficient demonstrations of the possibility of making work fine, thin and light, for Tiles either plain or crooked, and for the making of great work in Molds, and the through burning of them for Doors, Windows, and Chimney-frames, *&c.*

This is one of the most feasible and beneficial Operations that I know in *England* to be neglected.

Where either Tiles are scarce, or Timber not very plenty, that

that you would have your Houſe but lightly covered, *Shingles* are to be preferred before *Thatch*; and if they are made of good Oak, and ſhit or cleft out, and then well ſeaſoned in the water and Sun, they become a ſure, light, and durable covering. *Of Shingles.*

Where it may be had, the thin blew Slate ſeems to be the beſt covering, being very light and laſting. *Slate.*

This is a common covering in moſt parts, yet is ſome to be preferred before others; the beſt that I have ſeen is that which is called *Helme*, that is, long and ſtiff Wheat-ſtraw (with the Ears cut off) bound up in bundles unbruiſed, which well laid lies thin, laſts long, and is much neater than the common way. *Thatch.*

It is an uſual thing to ſee thick and tall walls to fall, either by reaſon of the weakneſs of the foundation, the weight of the wall, or the decay of the Cement or Morter through Age; which hath provoked ſeveral to great and unneceſſary expences in laying deeper and ſtronger Foundations, and in making the walls much thicker than uſual; when all that extraordinary coſt might be ſaved, by taking notice of theſe few Obſervations. *Of Building of Stone or Brick-walls.*

Firſt, that ſtreight walls, though thick, and ſeemingly ſtrong, yet either by the falſeneſs of the ground, or being obvious to high winds, or the decay of the Morter, are apt to lean or fall.

Secondly, that walls built crooked, though thin and weak, are yet more laſting than a ſtreight wall.

Thirdly, that a wall built over a River on Pillars or Arches, ſtands as firm as the reſt of the wall, whoſe Foundation is entire; as I have in ſeveral places obſerved.

Which plainly demonſtrates unto us, that a wall built up much thinner than uſual, having at every twenty foot diſtance (or ſuchlike, as you think fit) an Angle ſet out about two foot or more, according as the wall is in height, or having at ſuch diſtance a Column or Pillar erected with the wall ſix or eight inches or more on each ſide over and above the thickneſs of the reſt of the wall, the Foundation of ſuch jetting out or Column being firmly laid, that it muſt of neceſſity ſtrengthen the wall much more, than if five times the materials uſed in theſe Jettings or Columns were uſed in the wall being ſtreight; which moſt evidently ſaves you a great part of your expence, and your wall much more firm and compleat: for if it be a wall for Fruit-trees, theſe Nooks or Corners in the Jettings out, whether *Angular* or *Semicircular*, are ſecure places for the more tender Trees; or if they are Columns or Pillars, they make the wall much the warmer, by breaking the motion of the Winde or Air that paſſeth by it: And theſe Foundations laid ſecure, although at that diſtance, ſupport the wall in looſe and falſe ground, as though it were entire; but if the ground be very looſe, you may project an Arch from each Foundation, though obſcurely.

It is a great injury to our Buildings, that our Cement is no better: in former Ages, when they built with ſmall and unequal ſtones, their Cement or Morter far exceeded ours, as is moſt evident in the ruines of old *Monaſteries*, *Caſtles*, *&c.* where *Of Morter.*

their Morter is far harder than in any of our more Modern Buildings.

It is a great errour in Masons, Bricklayers, *&c.* to let the Lime slacken and cool before they make up their Morter, and also to let their Morter cool and die before they use it; also their stone they let be moist before they use them: Therefore if you expect your work to be well done, and long to continue, work up your Lime quick, and but little at a time, that the Morter may not lie long before it be used; and also with dry stone, for which the Summer is principally to be elected.

For Brick, if it be in the Winter-time, let them be laid dry; if in the Summer-time, wet: It will quit your cost to imploy a Boy to wet them in the Summer, for they will unite with the Morter the better.

The Lime it self also in some places is very weak, being made of soft Chalk-stones; the other that is made of harder, is much to be preferred.

Of Timber. In former Ages they cut their Timber in the Winter-time, when the Sap was most out of it: but now, by reason of the scarceness of Oak (the principal Timber) our Statutes oblige us to fell it in the Summer for the Bark, being necessary for Tanners, *&c.* by which means our Timber shrinks, chaps, and decays much more and sooner than otherwise it would do; which inconveniences in square-Timber are not so apparent as in Plank, Board, or suchlike broad and thin work; therefore, in such cases, it requires some kinde of seasoning or other to prevent them: if you lay them in the Sun or Winde, they chap, or shrink, or cast.

The best remedy in that case, is to lay them in a Pool or Running Stream a few days, to extract the Sap that remains in them; and afterwards dry them in the Sun or Air, and they will neither chap, cast, nor cleave. Against shrinking there is no remedy.

When Timber or Boards are well seasoned or dried in the Sun or Air, and fixed in their places, and what labour you intend is bestowed on them, the use of *Linseed-oyl*, *Tar*, or suchlike Oleaginous matter, tends much to their preservation and duration. *Hesiod* prescribes to hang your Instruments in the smoak, to make them strong and lasting; *temonem in fumo poneres*: surely then the Oyl of Smoak, or the Vegetable Oyl, by some other means obtained, must needs be effectual in the preservation of Timber. Also *Virgil* adviseth the same.

Et suspensa focis exploret robora fumus.

Of Mills. In Ancient times they bruised their Corn in Morters; since which most tedious and incompleat way, Mills have been invented, some to be used by hands, as *Querns*, others to be moved by Horses, others by the Winde, and others by the Water; which last being maintained with least cost, more certainty, and

and moſt advantage, hath gained the Preheminence, and is made uſe of in every place, where there is water fit for that purpoſe, and where there is imployment, although a little for the eaſe and conveniency of the near Inhabitants, and for the particular advantage of the Owner, yet very much to the detriment and damage of the Kingdom in general, by injurious obſtructions of water, to the ſpoiling of much Meadow-ground, and by the preventing the uſe of the water for that moſt advantagious improvement of over-flowing or drowning of Land; which upon the removal of theſe Mills might be done, and the Corn as well ground to ſerve every ones occaſions.

Either by Windmills, which may be erected on Hills in Hilly places, and in Plains on any open place; where the winde may as well grinde all your Corn in places where the Water-mills now ſtand, as in other places where are only Winde-mills for many miles together.

Or by the Rectification of *Water-mills*, that a leſs quantity of water may do that which now requires a greater; to which end many have made very Ingenious attempts, and without queſtion may much be done in it, both in the framing and ordering the *Water-works*, (which we will paſs by) and in the contrivance of the Mill it ſelf, which doubtleſs goes much heavier by the Stone they call the *Runner*; its being ſo large, and its being incompaſſed with a Hoop or Caſe that keeps the Meal to the edge or circumference of the Stone, and much deads its motion: The larger the Runner is, the heavier it moves; which may in ſome meaſure be remedied, by making four or five vents or paſſages in ſeveral places of the Hoop, to take off the Meal as faſt as it is ground, that none may lie to clog the *Runner*.

Or a Mill may probably be ſo contrived, that the Grinding-ſtone or Runner may be Vertical, and of but a ſmall circumference; the flat and ſquare edge whereof may be fitted into another fixed ſtone cut hollow, about the half or third part of a Circle; which Runner, by its firſt motion, may diſpatch as much Corn in the ſame time, as a larger the other way. Several alſo of theſe Vertical Stones may be on the ſame *Axis*; this may be uſed in all the ſaid ſorts of *Mills*.

CHAP. XII.

Of Fowling and Fiſhing.

SECT. I.

Of Fowling in General.

1 *Of Fowling.* FOraſmuch as moſt Farms and Country-habitations lie neat unto the Sea, great Rivers, large Fens, Marſhes, *&c.* to which are great reſorts of Water-fowl, or elſe are well furniſhed with Land-fowl, either of which are very profitable to the Husbandman: Wherefore it may not be amiſs to add ſome general directions for the taking of them; which will redound to his advantage, not only for their Carkaſſes, but for that many ſorts of the Land-fowl are ſomewhat injurious to his Husbandry.

2 It is generally obſerved, that Water-fowl are in their own nature the moſt ſubtil and wiſeſt of Birds, and moſt careful of their own ſafety; to which end they do form themſelves into an orderly Body or Camp, and have their Scouts and Sentinels at a diſtance, to give notice of the approach of an Enemy; which they ſuddenly do by a certain Watch-word, which will oblige you to be more cautious and careful than ordinary in your endeavouring to ſurprize them.

The Haunts of Water-fowl. It is needleſs here to particularize the ſeveral Haunts of each ſort of Water-fowl, ſeeing there are few that have Lands haunted with them, but they know anear in what parts they moſt uſually frequent. The one ſort that are not Web-footed, as the Heron, Bittern, *&c.* delight moſt in ſhallow waters, and boggy Fenny places. The other ſort that ſwim, as the Wilde-gooſe, Duck, Widgeon, *&c.* delight moſt in Rivers, large and deep waters, *&c.* where they may have plenty of water, and ſwim undiſturbed of Man or Beaſt; and eſpecially where the water is leaſt ſubject to Freeze.

The Wilde-gooſe delights very much in green Winter-corn: Therefore in ſuch Lands that are near the water may you finde them.

Moſt of theſe Fowl have their Day-haunts and their Night-haunts; for in the Day-time they uſually retire to ſome ſecure place where they may confidently reſt themſelves: In the Evening they take to their beſt feeding-places, and ſmall green ſtreams, where they dare not appear in the day.

SECT.

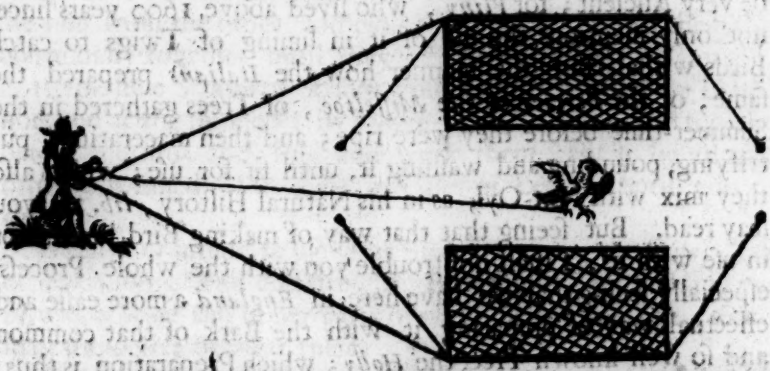
SECT. II.

Of taking the greater ſort of Fowl with Nets.

Let your Nets be made of the beſt Packthread, with great and large Maſhes; for the larger they are, the better, and the more ſurely do they intangle them; ſo that they be not too big to let the Fowl creep through them.

Let the Nets be about two fathom deep, and ſix in length: Verge your Net on each ſide with very ſtrong cord, and extend it at each end on long Poles; ſo that the two lower ends of the Poles may be faſtened with a piece of Line to two Stakes driven into the ground, at ſuch place where you have obſerved to be the Morning-haunts or feeding places of theſe Fowl: being there, place your Net two hours before they come; then at about two or three fathom beyond the Net, in a right line from the two Stakes, fix one end of the cord that the upper part of the Net was extended upon, holding in your hand the other end, which muſt be at leaſt ten or twelve fathom long; which on the appearance of Game within the Verge of the Net, you may ſuddenly pull, and caſt the Net over them. Let the Net be ſpread ſmooth and flat on the ground, and ſtrewed over with Graſs, Sedge, or ſuchlike, to hide it from the Fowl; and place your ſelf in ſome ſhelter of Graſs, Fern, or ſuchlike: If you have a Stale, you may place it within the Verge of the Net, which will very much conduce to the encreaſe of your ſport, which you may continue till the Sun be near an hour high; for after that time their feeding in thoſe places is over, until about Sun-ſet again.

The Form of a Draw-Net.



If your Net be large, and ſet for great Fowl, one of them will be as much as you can conveniently throw over them; but if you ſet for ſmall Birds, then two ſmall Nets may be placed after this manner.

SECT.

Sect. III.

Of the taking ſmall Water-fowl with Nets.

Let theſe Nets be made of ſmall and ſtrong Packthread, the Maſhes proportionable according to the Fowl you deſigne to take: Let the Net be about two foot and a half deep, and of length according to the breadth of the River, or other waters you intend to place them in, and the Net lined on both ſides with falſe Nets of Maſhes eighteen inches ſquare each way; that when the Fowl ſtrike, they may paſs through the firſt Net, and be intangled between them both.

Slake this Net athwart the River, the bottom being plumbed, that it may ſink about ſix inches, and the upper part ſo ſtrained, that it may lie ſlantwiſe againſt the current of the water, about two foot above the water; but let the ſtrings which ſupport the upper ſide of the Net, be faſtened to ſmall yielding ſticks prickt in the bank, yielding a little as the Fowl ſtrikes againſt the Net, the better to intangle them. Place ſeveral of theſe Nets at ſeveral diſtances on the River; and in the night, if any Fowl fall near them, you may be confident of your ſhare.

The better to accompliſh your deſigne, deter them from places that lie remote where the Fowl uſually haunt, by ſhooting at them; which will make them take to the River you have thus prepared.

Sect. IV.

Of taking great Fowl with Lime-twigs.

Beſides the Art of taking Fowl with Nets, there is a very ingenious way of taking them with Bird-lime, which ſeems to be very Ancient; for *Pliny*, who lived above 1600 years ſince, not only mentions the uſe of it in liming of Twigs to catch Birds withal, but the manner how the *Italians* prepared the ſame, of the *Berries* of the *Miſſeltoe*, of Trees gathered in the Summer-time before they were ripe; and then macerating, putrifying, pounding and waſhing it, until fit for uſe; which alſo they mix with Nut-Oyl, as in his Natural Hiſtory, *lib.* 16. you may read. But ſeeing that that way of making Bird-lime is not in uſe with us, I ſhall not trouble you with the whole Proceſs, eſpecially ſeeing that we have here in *England* a more eaſie and effectual way of preparing it with the Bark of that common and ſo well known Tree, the *Holly*; which Preparation is thus:

To make Bird-lime. Take the Bark of that Tree about the end of *June*, at which time it is full of Sap, and fitter for your purpoſe; fill your Veſſel with it that you intend to boil it in, then add thereto of clear water as much as the Veſſel will conveniently hold, and boil it ſo long, until the grey and white Bark riſe from the green;

green; which will be about twelve or ſixteen hours: Then take it off the fire, and gently decant or pour the water from the Barks, and ſeparate the grey and white Barks from the green, which lay on a Stone, or Stone-floor, in ſome Cellar or moiſt or cool place, and cover it over with Fern, or other green weeds, to a good thickneſs; the better to accelerate its putrifaction; which will be accompliſhed in twelve or fourteen days time, and ſometimes leſs, and it reduced to a perfect Mucilage: then pound it well in a large Morter with an wooden Peſtle, until it be ſo tempered, that no part of the Bark be diſcerned unbruiſed. After which waſh it exceeding well in clear water, by renewing the water and your pains ſo often, that no foulneſs or Motes remain in it; and put it into a deep Earthen Veſſel, where it will purge it ſelf for four or five days together: Then ſcum it clean as its filth ariſes; and when it hath done purging, put it into a clean Veſſel, and keep it cloſe for uſe.

The Bark of the Birch-tree is by ſome affirmed to make as good Lime, as that of the *Holly*, being the ſame way to be prepared; ſo that you may try or uſe which is moſt eaſie to come by. Alſo you need not boil either of the Barks, if you give it longer time to putrifie; for the boiling is only to accelerate putrifaction.

When you intend to uſe it, take as much of it as you think fit, and put it into an Earthen-pot, with a third part of Capons-greaſe or Gooſe-greaſe well clarified, and ſet it over the fire, and let them melt together: Stir them until they are throughly incorporated; and ſo continue ſtirring off the Fire, till it be cold.

If you fear the freezing of your Bird-lime, add in your laſt mixture a quarter as much of the Oyl *Petrolium*, as you do of the Gooſe or Capons-greaſe, and no cold will congeal it.

When your Lime is cold, take your Rods and warm them; then a little beſmear the Rods with your Line, and draw the Rods the one from the other, and cloſe them again. Work them thus continually together, until they are all over equally beſmeared.

If you lime Straws or Strings, you muſt do it when the Lime is hot, and at the thinneſt, by folding and doubling them together before the fire; and fold and work them, till it be all over throughly limed: Put theſe in Caſes of Leather until you uſe them.

When you intend to uſe your Bird-lime for great Fowl, take of Rods long, ſmall and ſtreight, being light, and yielding every way; Lime the upper parts of them before the Fire, that it may the better beſmear them.

Then go where theſe Fowl uſually haunt, whether it be their Morning or Evening haunt, an hour or two before they come, and plant your Twigs or Rods about a foot diſtance one from the other, that they cannot paſs them without being intangled; and ſo plant over the place where their haunt is, leaving a place in the middle wide enough for your Stale to flutter in, with-

without falling foul of the Twigs; which Stale you do well to provide and place there, the better to attract thoſe of its own kinde to your ſnares: from which Stale you muſt have a ſmall ſtring to ſome convenient place at a diſtance where you may lie concealed, and by plucking the ſtring, cauſe it to flutter; which will allure down the Fowl in view.

Prick the Rods ſloap-wiſe againſt the winde, about a foot above the ground or water; and if you ſee any taken, ſurprize them not ſuddenly if any more are in view, for by their fluttering others will be induced to fall in amongſt them.

A Spaniel that is at command, will be neceſſary to re-take them that might otherwiſe eſcape out of your reach, theſe Fowl being very ſtrong.

For ſmaller water-fowl. If you place your Twigs for the leſſer Water-fowl, as Duck, Mallard, Widgeon, Teal, *&c.* you muſt fit your Rods according to the depth of the water, and your Lime muſt be ſuch as no wet nor Froſt can prejudice; the limed part muſt be above the water. Here alſo it will be neceſſary to have a Stale of the ſame Fowl you intend to inſnare.

SECT. V.

Of taking Fowl with Springer.

Moſt of the *Cloven-footed Water-fowl* delight in Plaſhes, Water, Furrows, ſmall Rivolets, and ſuchlike places, ſeeking for Worms, Flat-graſs, Roots, and the like, in the Winter-time, eſpecially in froſty weather, when many other places are frozen up, and theſe warm Springy Water-tracts are open; where you muſt place *Springes* made of Horſe-hair, of bigneſs and length according to the greatneſs of the Fowl you deſigne to take; for the *Heron* or *Bittern*, it muſt be of near a hundred Horſe-hairs, and above two foot in length; for the Woodcock, Snipe, Plover, *&c.* not above eight or ten Horſe-hairs, and one foot in length: the Main Plant, or Sweeper, muſt be alſo proportionable to the ſtrength of the Fowl. For the manner of the making and ſetting them, I queſtion not but every place will furniſh you with Directors, (if you know it not already) which is much eaſier and better than any written Inſtructions. Obſerve alſo, that you prick ſmall ſticks, in manner of a Hedge, croſs-wiſe, athwart all the other by-paſſages, about half an inch apart, and ſomewhat above a handful above the water or ground, ſloaping towards the place where your Springe is placed, the better to guide (which is eaſily done) the Fowl into the Snare: for ſuch is their nature, that they will not preſs over, where they have liberty to paſs through any gap. If the places where theſe Fowl uſually haunt be frozen, you muſt make Plaſhes; and the harder the Froſt is in other places, the greater will the reſort of Fowl be here.

SECT.

SECT. VI.

Killing of Fowl with the Fowling-piece.

There are many places where *Fowl* ſettle and feed at ſometimes, yet ſo uncertain, that the former ways are uſeleſs: and there are alſo many places wherein you may not have the conveniency or liberty to make uſe of the ſaid ways of taking Fowl; yet there may you at opportune times meet with a good ſhot with your Fowling-piece, the length and bore of which ought to be proportionable the one to the other, and both to your ſtrength, and the place you uſe it in.

Let your Powder be of the beſt ſort, as new as you can, for with bad keeping it looſeth its ſtrength exceedingly; therefore let it be kept as dry as may be: Let it be well dried when you uſe it, and clean from duſt; it hath the more ſtrength, and leſs fouleth your Piece. Let your Shot be well ſized, not too great, for then it flies, but thin and ſcattering; nor too ſmall, the Bird being apt to fly away within it, having not weight nor ſtrength to enter far.

Shot being uſually above the value of ordinary Lead, and in many places not to be had of the ſizes you have moſt occaſion for; I ſhall therefore here ſet down the true Proceſs of making of it, of what ſize you pleaſe under Mould-ſhot.

To make Shot. Take Lead of what quantity you pleaſe, melt it down in an Iron Veſſel, ſtir and clear it with an Iron Ladle, taking off all its impurities that ſwim at the top: When it is ſo hot as that the colour of the Lead begin to be greeniſh, and not before, ſtrew upon it *Auripigmentum* powdered fine, as much as will lie on a Shilling, to twelve or fifteen pound of Lead; ſome will require more: then ſtir the Lead well, and the *Auripigmentum* will flame. Let your Iron Ladle have a Lip or Notch in the brim, for the more convenient pouring out of the Lead; and let the Ladle remain in the melted Lead, for the moſt part, that it may be of a heat agreeable to the Lead, to prevent inconveniencies that may otherwiſe happen through its being over-hot, or too cold: Then take out a little of the Lead in your Ladle for an Eſſay, and cauſe it to drop out of it into a Glaſs of Water; which if the drops prove to be round, and without Tails, there is *Auripigmentum* enough in it, and the temper of the heat is as it ought to be; but if the congealed drops or ſhot prove not round, but with Tails, then add more of the *Auripigmentum*, and augment the heat, until you finde it right.

Then take a Copper-plate, about the ſize of an ordinary Trencher-plate, with a Concavity in the middle about three inches Diameter, perforated with about thirty or forty ſmall holes, greater or leſſer, according as you would have your ſhot to be: This Concave bottom ſhould be thin, but the thicker the brim is, the better will it retain the heat. Place this *Plate* on

two Bars, or other Iron-frame, over a Tub or Pail of water, about four inches from the water, and lay on the Plate burning Coals, to keep the Lead melted upon it.

Then with your *Ladle* take off your *Lead*, and pour it gently on the Coals on the middle of the Plate, and it will make its way through the holes in the bottom of the Plate into the water, and fall into round drops. Thus continue your Operation till all the *Lead* be paſſed through the *Plate*, blowing the Coals to keep them alive, that the *Lead* may not cool on the *Plate*, and ſtop the holes.

Whileſt you are thus pouring on your Lead, another (Stander-by) may take another Ladle, and put it four or five inches in the water under the bottom of the Plate, and catch ſome of the Shot as it drops down, and ſee what faults are in it, that you may ſtop your hand until they are rectified.

The greateſt care is to keep the Lead on the Plate, in ſo moderate a degree of heat, that it be not too cool to ſtop the holes, nor too hot, which will make the drops crack and fly; if it be too cool, blow the Coals a little; if too hot, ſtay your hand until it be a little cooler: the cooler it is, the larger will be your ſhot; the hotter, the ſmaller. As near as you can, obſerve the right temper of the heat, and you will have very round ſhot without any tails.

Then take your ſhot and dry them over the fire with a gentle heat, always ſtirring them that they melt not; and when they are dry, you may ſeparate the ſmall from the great in Sieves made for that purpoſe, according to the ſeveral ſizes they are of: But if you would have them very large, you may with a ſtick make the Lead trickle out of the Ladle into the water without the Plate.

If the Lead ſtop on the Plate, and yet not too cool, give the Plate a little knock, and it will drop again. Be ſure let there be none of your Inſtruments Greaſie, Oyly, or the like. When you have ſeparated your ſhot, if any of it proves too great, or too ſmall, or not round, preſerve them for the next Operation.

Thus having your Fowling-piece, your Powder and Shot ready, with your *Spaniel* well inſtructed, and at command, not daring to ſtir till you bid him; then are you fit for a walk towards your Game. If you are directly between the Winde and the Fowl, they will be apt to ſcent you; therefore it's beſt to go againſt the winde, or aſide it: it's better to ſhoot at one ſide of them, than before or behinde them; for if you break a Wing, you are ſure of that Fowl.

It's beſt to get as much ſhelter as you can by Hedges, Banks or Trees: for the ſight or ſmell of a man raiſes them, whatever danger of Hawks or any thing elſe be near.

Stalking-horſe. But if they are ſo ſhie, and the place ſo free from ſhelter, that there be no way to come at them fairly, then you muſt lead forth your *Stalking-horſe*, being ſome Old Jade trained up for that purpoſe, and that will be led in your hand as you pleaſe, and not ſtartle

ſtartle much at the report of a Gun; behinde whoſe ſhoulders you muſt ſhelter your ſelf, and take your aim before his ſhoulders, and under his neck, which is better than under his belly.

If you have not ſuch a Beaſt ready, you may make an Artificial one of any old Canvas, in ſhape like a Horſe feeding on the ground. You may make it double, and ſtuff it; or ſingle, and painted of a brown colour like a Horſe: Let it be made on a ſharp ſtick, that you may fix it into the ground as you have occaſion, when you take your Level. *Artificial Stalking horſe.*

It muſt be ſo light, that you may carry it in one hand, and high enough to conceal your body from the Fowl. You may alſo make an Artificial Oxe or Cow, which you may uſe for a change, that when your Horſe is diſcovered through much uſe, you may change for the other, and ſo make your Sport dure the longer: Or you may make Artificial Stags or Bucks with their real horns on them, which will be beſt in ſuch grounds where thoſe Creatures frequent, and with whom the Fowl are more familiar.

You may either make the repreſentation of a Tree in Canvas, and painted like one, and ſo ſpread with ſmall ſticks that it may ſomewhat reſemble a Tree, or you may with many Boughs ſo form a Tree, that it may ſhelter you from the view of the Fowl, making it with a Spike at the bottom, that it may ſtick into the ground when you aim at your Game. *Artificial Trees.*

A ſhort Digreſſion concerning Decoy-Ponds.

Falling into this diſcourſe concerning Water-fowl, I cannot omit to give you ſome incouragement to proſecute this moſt ingroſſing way of taking them by Decoys; that, which unleſs ſeen or known, may ſeem incredible, how a few ſubtil Fowl ſhould be able to draw, decoy, or trapan ſuch multitudes of their own Kinde into a known Snare, and there leave them to their unfortunate ends; ſuch unnaturalneſs being not to be parallelled in any other Creature whatſoever. They are a peculiar Species of that kinde of Fowl, and are from the Egg trained up to come to hand. The manner of doing it, and the making of the Pond, and the ſeveral apartments belonging unto it, requires a skilful Artiſt, and not Book-directions.

That they are of conſiderable advantage, is not to be doubted, there being many of them erected in the Maritime parts of this Kingdom, the gain whereof is from the vaſt numbers of them taken in the Winter-time, which are ſupplied from the more Northern Regions, whence the Froſt, Ice and Snow, baniſh them into the more Southern. The Decoys flying abroad light into their company, and ſoon become acquainted with them, and allure them, being ſtrangers; and they willing to follow them in hopes of good quarters, are by theſe Decoys brought into the very place, where they become a ſufficient reward to the owner of the Decoy, and a great ſupply to the adjacent Markets.

To finde Duck-Eggs.

I may alſo ſubjoyn, that in thoſe Countries where the Wilde-Duck breedeth, you may go into the Fens, Marſhes, or places with a Spaniel, or other Beating-dog; and where the Dog puts up any Duck, or you otherwiſe finde a Neſt with many Eggs in it, in the Moneth of *March*, before Sitting-time, you may take them away out of the Neſt with an Iron Ladle (leſt you handle or breathe on the Eggs, and the Duck by your ſcent forſake her Neſt) leaving two or three in it, to incourage her to lay again there; which ſhe will do, it being their nature to lay till the Neſt be full: So once a week you may fetch them away, taking the oldeſt away as near as you can. Let the handle of your Ladle be of wood, about two or three foot long, that you may not go too near. Theſe Eggs may you ſet under your Hens or Ducks at home, the encreaſe whereof are much to be preferred to the Eggs of tame Ducks: only obſerve, that if they have opportunity, they will take their leave of you, unleſs you have places ſecure for them to feed in; for the Bird it is of the nature of the Egg, and will be wilde when old enough to take wing, or hath the opportunity of a Stream to carry it away. But if you have conveniency to make you a Duck-houſe and Duck-ponds, with convenient Receptacles for them to lay their Eggs in, and ſecure their Brood, they will never forſake you, but make that place where they were bred their place of refuge, and conſtant abode by day, although they prey abroad in the night. They will alſo, much after the manner of the Decoys, bring many to them in the Winter-time.

SECT. VII.

Of taking Land-Fowl.

Thoſe that are uſually termed Land-Fowl, are ſuch that live and make their haunts generally in the Woods, Fields, Heaths, *&c.* as the Pheaſant, Partridge, Poults, Quails, Rails, Wood-pigeons, Black-birds, Throſtles or Thruſhes, Field-fares, Larks, Wheat-ears, *&c.* all which are diverſly taken and inſnared. The moſt part of them, by the cunning and skill of the Fowler, are ſhot with a Fowling-piece, either perched by a Dog, or otherwiſe, or flying, wherein many have a very excellent Faculty, more rarely miſſing that way than perched; which by practiſe may be eaſier attained unto, than by any Rules or Precepts.

Of taking Fowl by Day-Nets.

Any Fowl that gather together many in a flight, may be taken in Nets by day; as *Pigeons*, *Larks*, *Sparrows*, *Crows*, *Rooks*, *&c.* and that either by baiting ſome place for them in their uſual haunts, or by laying the Net in ſuch haunts, and wheedling them in by a Stale, or ſome other inticing way. The manner of ſetting and placing ſuch Draw-net you have before deſcribed; only you muſt have the Maſhes, and the length and depth of your Net, proportionable to the Game you deſigne to take.

Of taking Larks by Day-Nets.

If you place theſe Nets for *Larks*, the ſeaſon is from *Auguſt* to

to *November*: the earlier you ſet them in the morning, the better; and the brighter the Sun, and the milder the Air, the better will your ſport be.

The open, plain and Champion-lands, are the places for this ſport, eſpecially on the Barley-ediſhes.

The only way to intice the *Lark* into your ſnare, is to place in the middle of the Verge of your Net an Inſtrument made to move nimbly, by plucking it with a ſmall line or packthread to and fro; on which ſhould be fixed ſome pieces of Looking-glaſs, that by the continual whirring motion of it, the glittering of the Looking-glaſs by the reflection of the Sun in the eye of the *Lark*, allureth her down to the Net, eſpecially if there be a *Stale*.

When one or two are in the compaſs of your Net, let them alone until they attract more company to them: Preſerve ſome of them alive that you take, for *Stales*.

A dry Stale.

But if you cannot conveniently get a live *Stale*, ſhoot a *Lark*, and draw out his Intrails, and dry him in an Oven in his Feathers, with a ſtick thruſt through him, to preſerve him in a poſture convenient: This *Stale* may ſerve near as well as a living one. Thus may you make *Stales* of any ſorts of Birds, and keep them by you without any daily charge or trouble as living *Stales* put you to.

Another way to take Larks by a Day-Net, called, Daring of Larks.

There is another way of taking the timerous *Lark* by a Day-net, made in form of a Scoop-net that they uſually take up Fiſh withal out of Stews; which Net you muſt make of the fineſt thread; or you may make a ſmall Trammel-net to draw over them: having either of theſe Nets ready, then with a *Hobby*, either dead or living, (or any other Hawk will ſerve indifferently well) go into the Fields, where *Larks* uſually are about *Harveſt*, and beat them up with a Spaniel, and obſerve where they pitch: Then hold up your Hawk as high as you can, the ſight whereof will cauſe the *Lark* to crouch very cloſe, that you may cover her with either Net; for ſhe is ſo fearful of the *Hobby*, that about this ſeaſon preys on that Bird, that ſhe will ſuffer you almoſt to take her with your hand, rather than adventure her ſelf in the Air. This ſport laſts till about *Michaelmas*, at which time the *Hobby* leaves this Country, or that Exerciſe; and then the *Lark* is more confident.

To take Birds with the Low-Bell.

If you cannot, through want of time or skill, accompliſh your ends in this Pleaſure or Recreation by day, you may more eaſily do it in the night ſeveral ways: If in Champion and level Countries, then by a Low-bell, from the end of *October*, until the Birds begin to couple towards the Spring: And in the darkeſt nights, or at leaſt the dark time of the night, your Bell muſt have a hollow, deep, and doleful ſound. Your Net muſt be about twenty yards deep, and ſo broad as you can conveniently manage it: Then go into the ſtubble-Fields, where the Birds uſually take up their Night-quarters; the *Wheat-Ediſh* is the beſt. He that carries the Bell muſt go foremoſt, tolling the

Bell

Bell very mournfully, and not too hard; then let the Net follow, being ſupported at each corner, and on the ſides; and when you come where you think the Game lies, pitch your Net; no noiſe being hitherto heard but that of the Bell: then light your Straw, or Torches, at the Coals or Candle carried in a Dark-Lanthorn, by one to that purpoſe, and beat the ground, and make a noiſe; and the ſight of the Fire or light will make them inſtantly riſe, and be intangled in the Net: Then put out your lights, and keep your uſual ſilence, and proceed as before. Thus may you take Partridge, Rails, Quails, Larks, *&c.*

To take Birds with the Trammel only.

You may alſo take the ſame ſorts of Fowl by night with a Trammel, being a Net longer than that you uſe with the Low-bell, the lower part of it plumbed with Lead looſe on the ground, the upper part ſupported at each end about three foot high; and ſo trailed along thoſe grounds you expect your Game on. At each ſide of the Net carry Wiſps of Straw burning, or Links, and let ſome beat the ground with long Poles; which will cauſe the Birds to riſe againſt the Net.

Bat-fowling.

There is alſo a way to take Birds in the Night-time, that rooſt or perch in Trees and Hedg-rows, which is called *Bat-fowling.* The manner is thus: When you come to the place where you expect your Sport, light your Straw or Torches, and beat the Buſhes or Hedg-rows, and the Birds will inſtantly fly towards the flames; where you may take them either with Nets at the end of Poles, or beat them down with Bruſhes made with Boughs at the end of Poles, or by carrying large boughs limed with Bird-lime to intangle them. This Sport is to be uſed when the weather is extreme dark, and with great ſilence till the lights are burning; for they are amazed at the light, being every way elſe very dark, and fly to the very flames; ſo that you may take them as you pleaſe.

To take ſmall Birds with Lime-twigs.

The manner of uſing Bird-lime you have before in this Chapter; but for the taking of ſmall Birds, the beſt way is to take a large bough of Birch, Willow, or ſuchlike Tree; prick and trim it clean from all ſuperfluity, that the Twigs may be ſmooth; lime the branches very well, but not too thick with the Lime: then place this Bough in ſuch place where thoſe Birds uſually reſort that you deſigne to take, ſtanding like a Tree; and place your ſelf at ſome convenient diſtance undiſcovered, imitating either with your mouth, or ſome Bird-call, the Notes of the Birds you aim at, which you muſt by practiſe learn; which will invite the Birds to the Tree you have prepared for them. Thus from Sun-riſing to ten of the Clock, and from one till near Sun-ſet, may you uſe this Sport.

Or you may lay ſmall Twigs limed, and about three or four inches long, in places where the Birds haunt; or ſtick them on the tops of Hemp-cocks or Wheat-ſheaves, or ſtick ſmall Boughs among Peaſe, which the ſmall Birds will ſuddenly pitch upon; which will be a means to leſſen the number of thoſe deſtroyers of Corn, Grain, Seed, *&c.* But if you uſe a Stale of one or two

living

living Night-bats, placing them aloft, that the Birds may gaze at them; or an Owl, which is the better of the two, moſt ſorts of Birds will draw towards her, and ſo fall into your Snare: A dried Owl will ſerve for want of a living one.

To take Field-fares, or Bow-thruſhes.

Alſo in the Winter-time the Field-fares and Bow-thruſhes, which uſually fly in great Flocks, are eaſily taken, by liming two or three large boughs, and fixing them on the top of ſome tall Tree, and placing in them two or three dried Stales of that kinde, and beat the Fields adjacent where thoſe Birds feed, and they will in great Flights take to that Tree where your Stales are, to your great pleaſure and profit.

SECT. VIII.

Of taking Fowl with Baits.

To take Land-Fowl with Baits.

Land-fowl, as *Doves*, *Pigeons*, *Rooks*, *Choughs*, and ſuchlike, may be taken with Baits; as by boiling Wheat, Barley, Peaſe, or other Grain in water, with good ſtore of *Nux Vomica*; and when they are boiled, almoſt ready to burſt, take them out and let them cool, and ſcatter this Grain where theſe Birds haunt; and it is ſaid, that by eating of it they will fall as dead, that you may take them with your hand: if you boil ſmaller Seeds, you may take ſmaller Birds by the ſame way.

They alſo ſay, that the ſaid Grains or Seeds ſteeped in the Lees of Wine, will work the ſame effect; which if it doth, it is much the cleanlier way, and doth not infect the Bird with that poyſonous quality, as doth the *Nux Vomica*.

To take Water-Fowl with Baits.

It is alſo ſaid, that *Bellenge*, Leaves, Roots and all, cleanſed very well, and ſteeped in clear running water for twenty four hours, and boiled in the ſame water till the water be almoſt conſumed: Then when it is cold, this Plant being taken and laid in the haunts where Wilde-geeſe, Duck, Mallard, Buſtard, or any other Fowl affecting the water uſually frequent, that theſe Fowl will feed on it, and be ſtupified or drunk therewith; and the more, in caſe you add a little Brimſtone in the Concoction. But this is left to the experience of thoſe that know the Plant it's Vertues, and the inticing quality it has to invite the Fowl to taſte it.

SECT. IX.

Of taking ſome ſorts of Fowl.

Thus have I given you a hint of the divers ways of taking Fowl in general; but ſomething more may be ſaid as to the particular ways uſed in taking ſome ſorts of Fowl, that are not proper for any other: As in taking the *Pheaſant*, much skill is uſed and imployed in taking him, being the beſt of all Land-fowl that are wilde. The one way is, after you have found their haunts,

To take the Pheaſant with Nuts.

haunts, which are usually in young Copses, where you must carefully view the several places, and by that means may finde them, Young and Old together. Provide your self with a *Pheasant-call*, and learn all their distinct Notes; and having a Net made of blew or green thred, about sixteen or eighteen foot long, and seven foot broad, verged with small Cord, go into the Woods where these Fowl are, and make use of your Call first softly; and so encrease your Note, until you hear them answer; then approach by degrees towards them, until you are in view: then spread your Net with as much secresie and silence as you can, at some distance from the ground, fixing the one end to the ground, and holding the Line in your hand, withdraw your self to some convenient distance, and use your Call again; and when you perceive the Pheasant's under your Net, then rise up and shew your self; and as the Pheasants rise, they are intangled in your Net.

To drive young Pheasants. When you have found an Eye of *Pheasants*, and their rode or tract in the Copses where they usually run, then place your Nets hollow, loose, and circular-wise, that when the Birds are in, the Nets may fall on them and intangle them: Then with a Driver, being a bundle of Wands or Rods, a little stir the Bushes or Trees, making some noise, the young Pouts will then run forward; and as they stand, you must still keep raking with your Driver gently, only to frighten them forward, until you have driven them under your Nets. You must be sure to conceal your self from the sight of them, and not drive them too hastily, lest they struggle abroad, and hide themselves where you cannot finde them.

To take Pheasants with Lime-twigs. In the Winter-season, when the leaves are off the Trees, then may you take these Birds with Lime-twigs, either stuck fast in the ground, or laid loose in the Paths where they usually frequent; then with your Call, keeping your place where you first set your self, you may induce them to come towards you, and be intangled in the Twigs: when one is intangled by her fluttering, she will go near to intangle all the rest by their coming to assist her. It will be necessary to have a Spaniel at hand, lest any of them escape with the Twigs.

To perch Pheasants. The most usual Method of taking this Fowl, is by a Spaniel that is brought up to the Sport, which will hunt after them; and when he hath discovered a Pheasant, she will immediately take to a Tree, at which the Spaniel will bay; whereby you have notice (if within hearing) where the Pheasant is, whose nature is to eye the Dog, knowing her self to be out of his reach, and not to regard any other danger, though never so near, that you may command her at pleasure with your Fowling-piece.

To take Partridges. Next unto the Pheasant the Partridge is preferred to any Land-fowl, and is to be taken divers ways: Their haunts are easily known; scarce a Carter or Day-labourer that useth the Fields, but can tell you where these Birds usually resort; but

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to finde the *Covey* in ſuch haunt, is the difficulty: ſome are ſo ingenious they can do it by the eye, only diſtinguiſhing their colour from the earth; others by a Call, imitating their Notes at their Juking-time, which is uſually in the Morning, and in the Evening.

Having diſcovered them, draw forth your Trammel-Net, and take a large circumference, with a good round pace and careleſs eye, nearer and nearer towards the Birds, until your Nets are trimmed and fitted for your purpoſe, and you within the Nets length of them; then prick down the ſtick to which one end of the Net is faſtened, and walk round till you cover them; then let down your Net, and rouze them up, that they may be intangled. *with the Trammil-Net.*

Having a good Setting-dog well taught and at command, he will ſoon diſcover to you where the *Covey* lies: then trim your Nets, as before is directed, and cover them. If there are two of you together, the one may hold one end of the Line, and the other the other end of it; and ſo draw the Net over them. *To take Partridges with the help of the Setting-dog.*

There is a very pleaſant way of driving Partridges into a Tunnel-net; which when you have diſcovered the *Covey*, you muſt place beyond them, having the winde with you, that you may drive them with the winde. The Net muſt have two long wings, extending each way wide and upwards towards the Birds, a little hovering over: then take your Artificial Stalking-horſe, and covering your face with ſomething dark blew, or green, you may eaſily drive them before the winde into the Net; the ſides whereof will direct them into the Tunnel, where you are ſure of them. *To drive Partridges.*

As you were directed for the Pheaſant, ſo may you lay limed ſtraws, cut off between knot and knot, in the haunts of theſe Birds; and with your Call draw them towards you, that in their way they may fall foul of your limed ſtraws: As ſoon as the one is intangled, all the reſt will be quickly after; for they run together like a Brood of Chickens, and will ſo beſmear one the other, that few of them will eſcape. *To take Partridges with Birdlime.*

The uſual way of inſnaring any manner of wilde Creature, is to underſtand what they moſt delight in, either for food or exerciſe; and therein to place your deſigne in betraying or inſnaring them. As for the Wood-cock, he is a Bird that is ſomewhat troubleſome to diſcover, whereby to command him by a Fowling-piece; and in his place of feeding tedious to take, by reaſon there goes but few in a Company: Therefore where they uſually haunt, it is obſerved, that they take a great deal of pleaſure in flying in the Night-time through open places in tall Woods, eſpecially in a dim Moon-light night: So that ſeveral perſons where they have thick Woods ſtanding on ſome brow of a Hill, have cut a paſſage ſtreight athwart the Hill, through which the Cocks in the Night-time fly to and fro for their pleaſure, and will, if any near, draw to that place on purpoſe for that *To take Woodcocks.* *To take them in a Cock-road.*

Exerciſe: Between which Trees if you place a large and fine Net before Night, you will be ſure in the Evening to have them intangled in your Net, as they endeavour to fly through their uſual Road, where one ought to attend to take them as ſoon as in the Net.

There is ſcarce any Bird that flies, but there is ſome peculiar way of diſcovering or inſnaring him, different from another: as the *Quail*, or *Rail*, by Pipes or Calls; the *Moor-poot*, or *Heath-poult*, diſcovered by their eye, and ſeveral others. Which ſeveral ways we leave to the more Experienced, and to the ſeveral practiſes of the ſeveral places where they uſually frequent.

Of Fiſhing.

AS the Art of taking Fowl is very neceſſary to be known of moſt Countrymen; ſo alſo is the Art of Fiſhing, eſpecially to ſuch as live near to great Rivers, where they are bred and fed without any charge, labour or damage to the Countrymen that inhabit by ſuch Rivers; and ſo become very profitable to thoſe parts through which ſuch Rivers run, and to thoſe that have the priviledge and skill to take them.

Fiſh are divers ways taken; either by Nets, Pots, or Engines, by Angling, or by ſtupifying Baits, inticing or alluring objects; and theſe ways are uſed either by day or by night: Alſo at different ſeaſons of the year, the Fiſh as well as Fowl having their ſeaſons; of all which we ſhall give you ſome hint.

SECT. I.

Of taking Fiſh by Nets, Pots, or Engines.

To Fiſh with Nets. The uſual way of Fiſhing by Nets is of the greateſt advantage, and ſo of greateſt deſtruction to thoſe watry Animals, which if not moderately uſed, deſtroys whole Rivers of them; to prevent which, there are ſeveral good Laws made, though ſeldom executed. And could all men that are concerned in this Exerciſe agree to neglect the uſe of Nets but for two or three years, the Fiſh would encreaſe innumerably, that in many years after they could not be deſtroyed; which being very unlikely, yet it were feaſible to compel all Fiſhermen that they take no young Fiſh, nor Fiſh in their Spawning Moneths: for if they were permitted to Spawn but once before they are taken, they would ſufficiently ſtock the Rivers where they are; for the deſtruction of *Fry* and *Spawns* is the ruine of the Fiſhing in moſt Rivers.

With the Tramil or Sieve. The moſt uſeful Nets in great Waters are the *Trammel* and *Sieve*; which, according to their Meſh, may be uſed for moſt ſorts of Fiſh. The making and manner of uſing them are known to moſt Fiſhermen.

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The moſt pleaſant and recreative way is with the Caſting-net, ſpreading like a Cloak, and verged round with Plummets, that over whatſoever Fiſh it is thrown, it brings them to your hand. This Net is either thrown off from the Banks ſide, or from a Boat, according as the water will give you leave: If the remarkable places that you intend a fling at were baited beforehand, your Sport would be the better. *with the Caſting-Net.*

In ſmaller Rivers, where there are Roots or Stems of Trees, under which the Fiſh uſually ſeek for ſhelter in the day-time, the Net vulgarly called the *Shore-net*, which is a Net broad and open before, about five foot, and ending backwards in a long and narrow Cod. The forepart of this Net is fixed to a ſemicircular Rod, and to the ſtring that ſtrains the two Extreams of that Rod, in form of a Bow-ſtring: In the uſe of it, you pitch the ſtraight ſide of the Net downwards againſt the place or ſhelter where you ſuppoſe the Fiſh are; which Net you hold ſtrongly againſt the place, by the help of a Stail or handle that is fixed athwart the Bow, and extends down to the String. Whileſt you thus hold the Net, your Companion with a Pole ſtirs in the place of refuge; and what Fiſh are there will ſuddenly bolt out into your Net. By this means, not only Fiſh in ſmall Rivers, as Trouts, Humbers, *&c.* are caught, but Salmon alſo in great Rivers, where the water is thickned by the Tide; the Fiſherman ſtanding againſt the water with the Cod of the Net between his legs, and as ſoon as he perceiveth the Fiſh bolt into the Net, he forthwith lifts it up. *with the Short-Net, or Poke-Net.*

In ſeveral great Rivers where ſhelter is ſcarce, many have ſet large Pots made of Oſier, with bars in them, that when the Fiſh are in them, driven either by the Current, or ſeeking therein for ſhelter, they could not get out again. They are alſo laid in ſwift Currents, and at Mill-tails, and ſuchlike places, for the taking of Eels, which in dark nights, warm weather, and thick waters, run down with the ſtream in great plenty. *with Fiſh-pots.*

In great Rivers, the greateſt deſtruction of Salmon, and alſo advantage, is made by Wears erected in the Main Stream, that when thoſe Fiſh whoſe nature is to ſwim againſt the ſtream, and to ſpring or leap over any natural obſtacle that ſhall oppoſe them, by their endeavour to raiſe themſelves over theſe Wears, try to leap over, they fall ſhort, and are taken in Grates ſet at the foot of them for that purpoſe. Many other Engines there are to intercept their paſſage up againſt the waters, none of which are very injurious to the encreaſe of that Fiſh, were they diſcontinued in the Autumnal ſeaſon; at which time thoſe Fiſh ſtem the ſwifteſt Currents, that they may lay their Spawn in the ſmall ſhallow ſtreams, which Nature hath inſtructed them to do, it being the ſweeteſt meat other Fiſh can feed, and ſo conſequentially the beſt bait for a nimble and greedy Angler: At which ſeaſon thoſe that do eſcape theſe deſtructive Wears, are too often met with by the ignorant Ruſtick, who with his Spear commonly aſſaults them in the Shallows; and after theſe Fiſh have Spawn- *with Wears.*

ed, and their Spawn converted into the young broo d, the Spring following they naturally deſcend with the ſtream, and by greedy Millers and others are commonly the greateſt part of them intercepted in their Pots; yea, ſometimes in ſo great quantities, that for want of a preſent Market they have given them to their Swine. All which are the principal cauſes of the great ſcarcity of that Fiſh in theſe parts of *England*.

with Hawks. There is a ſort of Engine, by ſome termed a Hawk, made almoſt like unto a Fiſh-pot, being a ſquare frame of Timber fitted to the place you intend to ſet it in, and wrought with wire to a point almoſt, ſo that what Fiſh ſoever go through the ſame, cannot go back again. Theſe placed the one where the River enters into your Land, the other where it runs out, with the Points of each towards you, any Fiſh whatſoever that moves with or againſt the water, when they are once within the Hawks, cannot get back again. In caſe the River be broad, you may place two or three of theſe at an end in it; a frame of Timber being ſet in the water that it break not out on either ſide, nor under, leſt your Fiſh eſcape. Theſe Hawks ought to be made moveable, to take off or on, as you ſee occaſion.

The way of making a Piſcary. But in caſe you are in danger of Land-floods, or that you have not the command of the Land on both ſides, or of ſuchlike impediment; then may you cut a large Channel out of the ſides of the River, and as deep as the bottom of the River, with ſome part of the Current through it, and place theſe Hawks at each end of it, the better to intice the Fiſh into it. At ſome convenient diſtance from the River, and in the Piſcary, on the top of a ſtake pitch'd in the midſt of the water, and a little above the water, fix a Laton-caſe, in form of a Cylinder, about three or four inches Diameter, and twelve inches long, in which ſet a Candle burning in dark nights, the light whereof ſhines only upwards and downwards: it muſt be open at the top, becauſe it preſerves it burning: the downward light intices the Fiſh into your Piſcary; ſo that no Fiſh paſſes up nor down the River, but will ſeek their way through the Hawk into the light. By this very means I have known a Piſcary well ſtored in a few nights.

A Hawk-Net. There is a Net made round, and at each end a Hawk, that being ſet in the water and depreſſed by Plummets or Stones, and having in the in-ſide thereof ſhining ſhells, or red cloth, or ſuchlike inticements, the Fiſh will ſeek their way in, but cannot get out.

As for Fiſhing in the night by fire, and ſtupifying of Fiſh with unwholeſome Baits, or with Lime, or ſuchlike, being ways uſed by evil-minded perſons, that rather deſtroy the properties of other men, than lawfully uſe them for their neceſſary ſubſiſtence; I ſhall decline any advice or directions in that kinde, and proſecute that moſt lawful, juſt, and honeſt way of Angling, ſo much celebrated by the Ingenious of every degree.

SECT.

SECT. II.

Of Angling.

There is not any exerciſe more pleaſing nor agreeable to a truly ſober and ingenious man, than this of Angling; a moderate, innocent, ſalubrious, and delightful exerciſe: It wearieth not a man over-much, unleſs the waters lie remote from his home: it injureth no man, ſo that it be in an open large water; he being eſteemed a Beaſt rather than a man that will oppoſe this exerciſe: neither doth it any wiſe debauch him that uſeth it: The delight alſo of it, rouzes up the Ingenious early in the Spring-mornings, that they have the benefit of the ſweet and pleaſant Morning-air, which many through ſluggiſhneſs enjoy not; ſo that health (the greateſt Treaſure Mortals enjoy) and pleaſure go hand in hand in this exerciſe. What can more be ſaid of it, than that the moſt Ingenious moſt uſe it?

Obſervations in Angling.

When you have any leiſure days or hours from your ordinary Profeſſion or imployment, you cannot better ſpend them than in this Innocent Exerciſe; wherein obſerve that your Apparel be not of any bright or frightning colour, leſt that drive the Fiſh out of your reach, or make them timorous.

No bright Apparel.

Bait the ſtream or place.

That you bait the place you intend to Angle in, with ſuch things the Fiſh you aim at generally affect, for ſeveral days before you Angle, if it be a ſtanding or quiet water; but if a ſwift ſtream, there is no great need of any; but if you do, let it be but a few hours before, or juſt at your Angling-time, and that above your Hook.

Provide good Rods.

The beſt time to provide Rods and Stocks is in *December* or *January*, before the riſing of the Sap; when gathered, dry them by degrees, in a ſmoaky place is beſt; they are better to uſe at ſixteen moneths old than ſooner. To preſerve them, rub them over with Linſeed-oyl, or Sweet-butter never ſalted, twice or thrice a year: If your Stock be hollow, fill the bore with Oyl, and let it ſtand twenty four hours, and then pour it out again; this will preſerve it from injury.

If the top of your Rod be brittle or decayed, you may whip on a piece of Whalebone made round and taper, which will be better than the natural top.

The Line.

In making your Lines obſerve, that for moſt ſorts of Fiſh the Hair-line is the beſt, becauſe it is not ſo apt to ſnarl as other Lines, and will yield to the ſtreining of the Fiſh very much before it will break; which is a very great advantage in the taking of a ſtubborn Fiſh. Let the hair be round you make your Line withal, and as near as you can of a ſize: Alſo you may colour your hair of a ſorrel, grey, or green colour; but then they are a little weakned by the colouring.

The Hook.

It is good to provide your ſelf with all ſorts of Hooks; the ſmalleſt to take the ſmaller Fiſh withal, and the greater the greater

Fiſh.

Fiſh. Alſo with hooks peculiar for the Jack or Pike, and hooks to lay for Eels.

The Flote and Plummet. Your Flotes may be made of Quills, or of Cork and Quills, which are the beſt, and leaſt offenſive. Let your Plummet wherewith you ſound the depth of the water be of Lead, about the weight of a Musket-bullet; which is very convenient to know the depth of the water by.

Baits. According to the nature of the Fiſh, ſo you muſt provide your ſelf with baits. Herein obſerve, that if you open the firſt Fiſhes Maw that you take, you may ſee what that Fiſh moſt delights in for that ſeaſon. If you uſe Paſts for baits, you muſt add Flax or Wooll, to keep the Paſte from waſhing off the hook. The Eyes of the Fiſh you take are good baits for many ſorts of Fiſh; for the Trout, flies and Palmer-worms made Artificially, are the beſt baits in clear water, the ſeaſon being obſerved wherein each of them is to be uſed: Any baits anointed with Gum of Ivy diſſolved in Oyl of Spike, or with the Oyl of Ivy-berries, or the Oyl of *Polypodie* of the Oak mixed with *Turpentine*, will be great inticements to Fiſh to bite.

Seaſons for Angling. It is beſt fiſhing in a River a little diſturbed with Rain, or in Cloudy weather; the *South*-winde is the beſt, the *Weſt* indifferent, the *Eaſt* the worſt: but if the weather be warm, and the Sky Cloudy, they will bite in any winde. Keep your ſelf as far from the Water-ſide as you can, and fiſh down the ſtream. In a ſwift ſtream where the bottom is hard, and not too deep, if you go into the middle of it and caſt your Fly up againſt the ſtream, the Trout that lies upon the Fin in ſuch ſtrong Currents, and diſcerns you not, being behinde him, preſently takes your bait.

In *March*, *April* and *September*, and all the Winter-moneths, it is beſt fiſhing in a clear, ſerene, and warm day; but in the Summer-time, in the mornings, evenings, and cooleſt Cloudy weather.

After a clear Moon-ſhiny night, if the day ſucceeding prove Cloudy, is a very good time for Angling: for it is the nature of moſt Fiſh to be fearful to ſtir in bright nights; and ſo being hungry, if the weather in the morning prove Cloudy, they will bite eagerly.

Seaſons not to Angle in. To the intent that you may not labour in vain, I ſhall give you a hint of ſuch times that Fiſh delight not in biting; though ſome that have more than ordinary skill, may poſſibly take a few at any time.

In the extremity of heat, when the Earth is parch'd with Drought, there is little ſport to be obtained; nor in froſty weather, the Air being clear, unleſs in the Evening; nor in high winds; nor in ſharp *North* or *Eaſt-winds*; nor immediately after Spawning-time, their hunger being abated, and the Fiſh not worth taking: Nor yet after a dark night, for then the greater Fiſh have been abroad, and ſatiated themſelves; but the little Fiſh will then bite beſt, having abſconded themſelves all night for fear of the greater.

The

The greateſt Fiſh bite beſt in the night, being fearful to ſtir in the day: Therefore that is the beſt ſeaſon to Angle for them.

SECT. III.

Of Angling for Salmon *and* Trout.

The *Salmon* and *Trout* are Fiſh much of a Complexion and Nature, different in their ſeaſons from other Fiſh: The way of Angling for them is much after the ſame manner.

The *Salmon* biteth beſt in the Summer-moneths, about three of the Clock in the afternoon: He keeps not to one haunt, but ſwims generally in the deepeſt and broadeſt parts of the River, near the ground; and is caught with Worm, Fly, or Minnow. The Garden-worm is an excellent bait for a *Salmon*, if kept in Moſs about twenty days; which will ſcoure them, and make them tough and clear. *Salmon.*

You may alſo troul for a *Salmon* as you do for a *Pike*, with a Trouling-rod and line.

Your Artificial Flies for a *Salmon* muſt be larger than for a *Trout*, and the wings and tail long.

In Angling for a *Salmon* at ground, put two or three Worms at a time on the Hook, and give him time to gorge the bait.

The *Trout* is alſo taken with Worm, Minnow, or Fly. To fiſh for them in the night, which is the beſt time for the great *Trouts*, take two great Worms of equal length, and put them on your Hook; caſt them at a good diſtance from you, and draw them to you again on the top of the water, not letting them ſink, and give the *Trout* time to gorge his bait. Inſtead of theſe Worms, you may uſe a black Snail, or a piece of black Velvet, which is as well: They bite in the night beſt in the ſtill Deeps, but then unuſually in the Streams. *Trout.*

If you bait with a Minnow, you muſt place it ſo on the Hook, that the Minnow muſt run round as you draw it towards you; and to that end you muſt have a Swivel on your line, leſt the running round of the Minnow over-twiſt your Line. The ſame may you do for a *Salmon* or *Pike*.

If you bait with Flies, or Palmers Natural or Artificial, be ſure to obſerve the ſeaſon what Palmer or Fly they moſt delight in at that time; that take, or imitate it as near as you can.

SECT. IV.

Of Angling for the Pike *and* Pearch.

Theſe are two ſorts of white Fiſh that Spawn in the Spring early, and are greedy Fiſh of Prey, eſpecially the *Pike*, which will prey on its own Kinde.

You may take the *Pike* by hanging your Line to a Tree on the ſide of the River, with a living bait on the Hook, as a Minnow, *Pike.*

Dace,

Dace, Roach, or yellow Frog; but let not the Line hang at the full length, but contracted into a cleft ſtick, that when the *Pike* bites he may eaſily draw it out, and have time and ſcope enough to pouch his bait.

Or you may Trowl for him; which muſt be with a very long Line wound up at the handle of your Rod on a ſmall Winch or Windlace; and at the top of the Rod, which is ſtubbed, the Line muſt go through a Ring, that when the Fiſh hath taken the bait, he may, by your letting him have Line enough, gorge his bait, and hang himſelf. Your Line muſt be ſtrong, and armed with ſmall Wire next the Hook, about ſeven or eight inches.

You may Fiſh at Snap with him as with other Fiſh, if you pleaſe; but your Tackling muſt be very ſtrong.

A *Pike* bites at all baits except the Fly, and bites beſt at three in the Afternoon, in clear water, with a gentle Gale, from *Midſummer* to the end of *Autumn*. In Winter he bites all day long: In the Spring he bites in the Morning and Evening.

Perch. The beſt time to take the *Perch*, is when the Spring is far ſpent; for then you may take all near you at one ſtanding.

His baits are the Minnow, little Frog, or a ſmall Worm: He bites well all the day in cloudy weather, but chiefly from eight to ten, and from three to ſix. He alſo bites at almoſt any bait.

SECT. V.

Of Angling for ſtanding water, or Pond-fiſh.

The Fiſh that are moſt uſual in ſtanding waters or Fiſh-ponds, are the *Carp* and the *Tench*; Some there are that are common to both, as the *Bream*, *Dace*, *Roach*, *Eel*, and *Perch*. Angling for Pond-fiſh is the moſt eaſie of any way; and where there are a good ſtock, much ſport there is.

Carp. The *Carp* is the beſt of all freſh-water Fiſh, and will live the longeſt, except the *Eel*, out of the water. This Fiſh is very ſubtil, and biteth but ſeldom; and that in warm weather, cloudy; early in the morning, or late in the evening.

The baits for a *Carp*, are either Worms or Paſts. A Paſte made up of Bean-flower, Honey, and a little *Aſſafetida*, hath proved very well. Others have preſcribed Bean-flower, mingled with the fleſh of a Cat cut ſmall, and beaten very well in a Mortar with Honey, ſo long, till the whole is ſo tough to hang on a Hook without waſhing off. A little Wooll added in the making of it up, will make it hold the better.

Gentles anointed with Honey, and put on the Hook with a piece of Scarlet dipt in the ſame, is eſteemed the beſt of all baits for the *Carp*.

Tench. The *Tench*, for his ſliminеſs, accounted the Phyſitian of Fiſhes, delights only in ſtanding waters, and eſpecially amongſt Weeds, Flags, *&c.* In the hotteſt weather, early and late, and all night, this Fiſh delights moſt to bite.

He

He delights in the ſame baits as doth the *Carp*. The ſtronger the Paſts are of *Aſſafetida*, or other Gums or Oyls, the ſooner he will bite.

The *Dace* is commonly a River-fiſh, yet doth very well in Fiſh-ponds, if any think it worth their coſts and pains to keep them there: But in either place, the beſt baits for them are flies, whereof they affect the Ant-fly above the reſt. For ground-baits, the Grub that is found in plowed grounds, Gentles, and the young brood of Waſps, or ſuchlike, are very good: Small Worms, Paſts, and ſuchlike, they will not refuſe. *Dace.*

The *Roach* is much of the ſame nature as is the *Dace*, but more uſual in ſtanding waters than the other: Worms, and other ground-baits, are moſt proper for them. *Roach.*

Though the *Bream* be found in ſome Rivers, yet is moſt uſual and beſt in Ponds or ſtanding waters. The beſt time for Angling for them, is from the end of *July* until *Autumn*; for in *June* and beginning of *July* they Spawn, and are not in their ſeaſon. The beſt bait for them is the Red Worm that uſually lies at the root of the Dock: They alſo bite at Paſts, Waſps, Flies, Graſhoppers, *&c.* *Bream.*

As for the *Perch*, you have directions before concerning the taking of him in Rivers, the ſame will ſerve in Ponds.

The *Eel* is a Fiſh that delights in obſcure places, whileſt any light either of the Sun or Moon appears, being a ſweet Fiſh, and a prey to Fowl as well as Fiſh, but in the night time, and the darker the night the better. This Fiſh wanders abroad out of her lurking places, and preys on any bait that is fleſhie, either Worms, Snails, raw Fleſh, Frogs, young Birds, or the like. *Eels.*

You may Angle for them in the night in ſtanding waters, as you do for other Fiſh, and they will bite, ſo that you lie near, or on the ground. *By Angle.*

Alſo you may bait many Hooks over-night with Worms, and faſten them on the Bank-ſides: Let the bait lie in the ſtream on the ground all night, and you will have almoſt on every Hook an Eel, ſo that you be there at day-break in the morning to take them; for as ſoon as day-light appears they will unhook themſelves, though it be to the tearing to pieces their own Intrails. You muſt be ſure that your Hooks be ſtrong, and your Lines may be of good, fine and ſtrong handle-bound Packthread. *With Bank-hooks.*

Eels commonly abſcond themſelves under ſtones in ſtony waters, and under Timber, Planks, or ſuchlike; about Mills, Wears, Flood-gates, Bridges, *&c.* in the day-time, where you may take them by this way of *Sniggling*; that is, by baiting a ſtrong Hook on a ſhort but ſtrong Line with a large Garden-worm: Then with a ſtick cleft at the top, faſten therein the Line near the Hook, and guide the ſtick into the places where you think the Eels are, and thruſt it up and down, and you ſhall be ſure, if any Eel be there, as ſoon as ſhe feels the ſtick, ſhe will turn and bite; but be ſure you pull not too hard, leſt you tear out your hold. *By Sniggling.*

By Bobbing. There is a way of taking Eels by Bobbing; which is thus: Take of the large Garden-worms well ſcoured, and with a Needle run ſome ſtrong twiſted Silk through them from end to end, and wrap them oftentimes about a board; then tye them together with the ends of the Silk, that they may hang in Hanks, and faſten them at the end of a ſmall cord, with a Plummet of Lead, about three quarters of a pound, a little above the Bob: The other end of the cord faſten to a long Pole, and therewith may you fiſh in muddy water after a Rain. When you perceive by moving of your Bob that the Eels do tug at it, then gently raiſe them to the ſurface of the water, and ſo bring them to Land; for the Eels being greedy of the Worms, ſwallow them, and the Silk hangs in their teeth, that they are eaſily taken, five or ſix at a time. Some make up a bundle of new Hay and Worms together, and ſo let it down into the water; which the Eels readily come to, and thruſt their heads into the Hay after the Worms, and by that means are taken. Others take a round Net made faſt to a ſmall Iron-hoop, and let down into the water with a bundle of Worms in the midſt; which when the Eels come unto, by a ſudden raiſing the Hoop, are taken in the Net: for in ſome gravelly Tide-waters, Eels, eſpecially the ſmall Grigs, will ſeek abroad in the day-time, and give you excellent ſport.

SECT. VI.

Of Angling for the Barbel, Grailing, Umber, Chevin *and* Chub.

Barbel. Theſe Fiſh are not ſo Univerſal as the other before diſcourſed of; therefore the leſs ſhall be ſaid of them. As for the *Barbel*, it is a Fiſh very plentiful in the *Trent*, and comes in ſeaſon about the end of *May*, and ſo holds it till near *Michaelmas*, and hath his haunts amongſt weedy and hollow places, amongſt Piles and Stakes; is a ſtrong Fiſh, and muſt be taken with very ſtrong tackling: His bait is a very well-ſcoured Worm, Gentles, or Cheeſe ſteeped in Honey.

Grailing and umber. The *Grailing* and *Umber* are near alike; they are in ſeaſon all the Summer, and are then taken with a large Graſhopper, (the wings being taken off.) After the Graſhopper is on the Hook, at the point put on a ſmall Cadworm, and keep your bait in continual motion: Let the Hook be ſhank't with Lead, and covered with the bait.

The *Umber* is taken with a Fly, as is a *Trout*.

Chevin and Chub. The *Chevin* and *Chub* are common in the *Trent*, but no very pleaſant Fiſh: They are in ſeaſon all the Summer, and are taken with Worms, Flies, Snails, Cherries, Graſhoppers, Grain, Cheeſe, &c.

Small Fiſh. There are many other ſorts of ſmall Fiſh, as the *Bleak*, *Flounder*, *Gudgeon*, *Ruff*, *Minnow*, *Loach*, and *Bullhead*: The ways of taking them, for brevity ſake I ſhall omit. In

In the *Iſle of Wight*, and other places Weſtward, in the Rocks on the Sea-ſhore, are great numbers of Cormorants bred, being a large Fowl, and live only by preying on Fiſh; and are ſo dextrous at it, that in the open Seas they will dive, and ſwiftly purſue their game, and take and carry them to their Neſts; that the Inhabitants near adjacent do often go to theſe Rocks, and furniſh themſelves with Fiſh brought thither by them at their breeding-times. Theſe Birds may be ſo brought up tame, that they will in our ordinary clear Rivers dive, and take you as many Trouts, or other Fiſh, as you pleaſe, or the place affords, putting but a ſmall Collar over the neck of the Fowl, that the Fiſh may not paſs into her ſtomack. When you intend for your game, you muſt carry her out faſting: put on her Loop or Collar, and let her go into the water, ſhe will dive, and ſtreightly purſue the Fiſh ſhe hath moſt mind to, forward and backward; and when ſhe hath caught her game, ſhe gives it a toſs into the Air, and receives it end-wiſe into her mouth; which will ſtretch like the head of a Snake, and admit of a large Fiſh into her throat, which will ſtop at the Collar. Then hold out an Eel to her (which you muſt carry alive or dead with you to that purpoſe) and ſhe will come to your hand, and will by your aſſiſtance diſgorge her prey immediately, and to her ſport again; and will ſo continue, till ſhe hath furniſht you with as much as you can deſire. By this means may you take more than any other way whatſoever, and exceeds any of the Sports of Hawking or Hunting.

Cormorant Fiſhing.

10 JY 57

Kalendarium Ruſticum:

OR,

MONETHLY DIRECTIONS

FOR THE

HUSBANDMAN.

Being CHAP. XIII.

SHEWING

The moſt Seaſonable Times for the performing of his

Rural Affairs

Throughout the YEAR.

Operum memor eſto tempeſtivorum
Omnium ——— Heſiod.

LONDON:
Printed By *J.C.* for *Tho. Dring*, in the Year 1675.

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THE

PREFACE
TO THE
KALENDAR.

RUri, ſicuti in urbe, ſingula opera ſua habent peculiaria tempora: *There is a peculiar time for moſt Affairs in the World, but more eſpecially for ſuch Labours and Actions that depend upon the mutable ſeaſons of the Year; which being duly obſerved, is no ſmall advantage to the Husbandman:* Ephemeridem habeat quid quoque tempore faciendum, *is* Florentines *advice; that every Countryman may have his Draught before him to direct him, and reinforce his memory, that his multitude of occaſions may not ſo far obliterate thoſe things to his loſs and diſadvantage, but that he may here daily revive and renew his neceſſary intentions, and take Time by the Fore-lock;* as Pliny *obſerved*, Frontem Domini plus prodeſſe quam occipitum; *for Time is a thing ſo precious, and Occaſion ſo precipitous; and where many things are to be done, Time let paſs, prevents the ſucceſs of our endeavours, and loſs and confuſion ſucceeds;* Semper autem dilator operum vir cum damnis luctatur: *It is a very great neglect in* Agriculture *to be too late, it brings a conſiderable damage; like a backward year that produces a bad Crop, ſo doth a backward Husbandman meet with ſmall gains. You very rarely finde a thriving Husband behinde with his Affairs, or a declining Husband ſo forward as his Neighbour.*

Nudus ſerito, nuduſque arato,
Nudus quoque metito, ſi quidem tempeſtiva omnia voles,
Opera ferre cereris: ut tibi ſingula
Tempeſtiva creſcant, ne quando interim egens,
Mendices ad alienas domos, nihilque efficias.

It was Heſiod's *advice, to Plough, Sow, and Reap in good time, if you expect a compleat reward of your Labours.*

But if it be not in every ones power, though he knew the ſeaſons for all things, to obſerve them, by reaſon of the multitude and variouſneſs of buſineſs that flows upon the laborious Husbandman, at ſome certain times of the year more than at other, many caſualties alſo intervening; to ſuch it is adviſed, that they make uſe of the next opportunity convenient, to do what before they have omitted: Yet Cato *tells you*, Res Ruſtica ſic eſt, ſi unum

ſero

ſero feceris, omnia opera ſero facies; *neglect one, neglect all.*

There are two ſorts of Times and Seaſons preſcribed by the Ancients *to be obſerved in* Agriculture, *viz. of the Year, being only of the motion of the* Sun *through the Twelve Signs of the* Zodiaque, *which begets the different Seaſons and Temperatures of the* Spring, Summer, Autumn, *and* Winter; *and of the Aſpects and ſtate of the* Moon *and* Stars: *whereof, and alſo of ſeveral Prognoſticks of the mutability, ſtate and condition of the ſeveral Seaſons, and their Natural Inclinations, I ſhall give you at the end of this* Kalendar *a Breviat, and of ſuch Obſervations as I have found in ſeveral Ancient and Modern Authors treating of that Subject.*

As for the Times and Seaſons of the Year, from the beginning to the end thereof, every day ſomething is to be done by the Husbandman; as was ſaid of a Gardiner, that his work is never at an end, it begins with the Year, and continues to the next: Annus in opere Ruſtico abſolutus eſt: *yet is it not every year alike, neither is every place alike; ſome years, or at leaſt ſome ſeaſons of the year, prove more forward by two or three weeks, or more, at one time than at another: Alſo the ſcituation of places, either better defended from, or more obvious to the intemperature of the Air, begets ſome alterations. In theſe, and ſuchlike caſes, the ſubſequent Rules are to be ſeaſonably applied by the Judicious Husbandman, according as the ſeaſon happens to be earlier or later, or the different ſcituation of places requires.*

This Method in general is the ſame that hath been uſed by the moſt Ancient that (I have underſtood to) have written of Agriculture; *and alſo our Moderns, as you may obſerve in* Heſiod, Columella, Palladius de Serres, Auguſtino, Gallo, Tuſſer, Markham, Stevenſon, *and others; and laſt of all Mr.* Evelin *his excellent* Kalendarium Hortenſe, *at the end of his* Sylva.

I ſhall endeavour herein to be as brief as I can; I ſhall add nothing more than what is neceſſary, and ſhall leave out ſuch things that are but little to our purpoſe, and ſhall begin with the major part of our Preſidents *in the like caſe: although the year, in reſpect of the Suns entrance into* Aries, *and the Commencement of the date of the year, begins in* March; *yet* Tuſſer *declines both, and begins at* Michaelmas, *it being the uſual time for the* Farmer *to enter on his* Farm, *the ground being then more eaſily cleared of its former ſtock, than at any other time. But ſeeing that it is no very material thing when we begin, our labour having no end, we will tread the moſt uſual Path, decline both Extreams, and begin when our days do ſenſibly lengthen, our hopes revive of an approaching* Summer, *and our* Almanacks *give us a* New-years-day.

JANUARY.

JANUARY.

Day	*Sun riſe.* h. m.	*Sun ſet.* h. m.	
1	*New-years day*		
2			
3			*Caſtor* and *Pollux* riſe in the evening.
4	8 00	4 00	
5			
6	*Twelf-tide.*		
7			
8			*Lucida Corona*, or the *Crown*, is with the Sun.
9			
10	*Sun in Aqua.*		The *Dog-ſtar* riſeth in the evening.
11			
12			
13			
14			
15			
16	7 45	4 15	
17			
18			
19			
20			
21			
22	*Vincent.*		
23			
24	7 30	4 30	
25	*Pauls day.*		
26			
27			
28			
29			
30	K. Charles *his Martyrdom.*		
31	7 15	4 45	

Menſis difficillimus hic Hybernus; difficilis ovibus, difficiliſque hominibus.

THis Moneth is the rich mans charge, and the poor mans miſery; the cold like the days increaſe, yet qualified with the hopes and expectations of the approaching Spring: The Trees, Meadows and Fields are now naked, unleſs cloathed in white, whileſt the Countryman ſits at home, and enjoys the fruit of his paſt labours, and contemplates on his intended Enterpriſes. Now is welcom a cup of good Cider, or other excellent Liquors, ſuch that you prepared the *Autumn* before; moderately taken, it proves the beſt Phyſick.

A cold *January* is ſeaſonable: Plough up or fallow the ground

JANUARY.

you intend for Peaſe: water Meadows and Paſtures: drain Arable grounds where you intend to ſow Peaſe, Oats or Barley: rear Calves, Pigs, *&c.* lay Dung on heaps, carry it on the Land in froſty weather; on Paſture-land hedge and ditch.

Plant Timber-trees, or any Coppice-wood, or Hedge-wood; and alſo Quick-ſets: cut Coppices and Hedge-rows; lop and prune greater Trees.

Feed Doves, and repair Dove-houſes; cut away Ant-hills, and fill up the holes in Meadow and Paſture-grounds; gather ſtones, *&c.* have ſpecial care to Ews and Lambs; houſe Calves; Geld young Cattle ſoon after they are fallen: ſow Oats, if you will have of the beſt, ſays old *Tuſſer*.

Otes.

In Janivere Husband that poucheth the Otes,
Will break up his Lay, or be ſowing of Otes.
Otes ſown in Janivere, lay by the Wheat;
In May by the Hay, for Cattle to eat.

Garden and Orchard.

PLant Vines, and other Fruit-trees, if the weather be open and milde; dig and trench Gardens, or other ground for Peaſe, Beans, *&c.* againſt the Spring: dig Borders, uncover roots of Trees where need is, and add ſuch Manure to them as they require: you may alſo, if the weather prove milde, ſet Beans and Peaſe. As yet Roſes may be cut and removed.

Prune Orchard-fruits and Vines, ſo that it be not froſty; nail and trim Wall-fruits; cleanſe Trees of Moſs in moiſt weather.

Gather Cions for Graffs, and ſtick them in the ground; for they will take the better, being kept ſome time from the Tree; and at the latter end, if the weather be milde, you may begin to Graff.

Make your Hot-bed, and ſow therein your choice Sallads; ſow Colleflowers; ſecure your choice Plants and Flowers from the injury of the weather, by Covers, by Straw, or Dung: Earth up the roots of ſuch Plants the Froſts have uncovered.

Set Traps to deſtroy Vermine, where you have or ſow ſuch Plants or Seeds that they injure.

Take Fowl, deſtroy Sparrows in Barns, and near them; kill the Opes or Bull-finches that feed on the buds of Fruit-trees.

Hop-garden. Dig a Weedy Hop-garden.

Apiary. Turn up your Bee-hives, and ſprinkle them with warm and ſweet Wort dexterouſly. Alſo you may remove Bees.

FEBRU-

FEBRUARY.

Day	Sun riſe. h. m.	Sun ſet. h. m.	
1			
2	*Candlemas.*		*Cor Leonis* riſeth in the evening.
3			
4			
5			
6			
7			
8	7 00	5 00	Sun in *Piſces.*
9			
10			
11			
12			
13			
14	*Valentine.*		
15			
16	6 45	5 15	*Cor Hydræ* riſeth in the evening.
17			The *Tail of the Lyon* riſeth in the evening.
18			
19			*Fomahant* is with the Sun.
20			
21			
22			
23	6 30	5 30	
24	*Matthius.*		
25			
26			
27			
28			

Ut ſementem feceris, ita & metes.

THis is a principal Seed-moneth for ſuch they uſually call *Lenten-Grain.* This Moneth is uſually ſubject to much Rain or Snow: if it prove either, it is not to be accounted unſeaſonable; the Proverb being, *February fill Dike, with either black or white.*

Now ſow all ſorts of Grey-peaſe, Fitches, Beans and Oats: Carry out Dung, and ſpread it before the Plough, and alſo on Paſture-ground; this being the principal Moneth for that purpoſe.

Plant Quick-ſets newly raiſed; the Spring being ſo near, they will not keep long.

Set Willow-plants, or Pitchers; and alſo Poplars, Oſiers, and other Aquaticks.

Sow Muſtard-ſeed and Hemp-ſeed, if the Spring prove milde;

FEBRUARY.

feed your Swans, and make their Neſts where the Floods reach them not.

Soil Meadows that you cannot overflow or water; catch Moles, and level Mole-hills.

Alſo this is the only time for plaſhing of Quick-ſets, and a very good ſeaſon for the ſhrouding or lopping of Trees, or cutting Coppices.

Garden and Orchard. YOu may yet prune and trim Fruit-trees, and cleanſe them from Moſs and Cankers. Now is a very good time for grafting the more forward ſort of Fruit-trees, if the weather be temperate.

Your tender Wall-fruit cut not till you think the hard Froſts are over.

Plant alſo Vines, or any ſorts of Fruit-trees in open weather: trim up your Palliſade-hedges and Eſpaliers: ſet Kernels, Nuts, or ſtones of Fruit, and other hard ſeeds.

Lay branches to take root, or place Baskets, *&c.* of Earth for the branches to paſs through.

Sow Anniſe, Beans, Peaſe, Raddiſh, Parſnips, Carrots, Onions, Parſley, Spinage, and other hardy Herbs or Seeds, and plant Cabbage-plants: plant out Colleflowers into warm places: Alſo plant Liquorice. Yet you may deſtroy Sparrows. Now is the time the Bull-finch doth the greateſt harm to the buds of Fruit-trees.

Make up your Hot-beds for Melons, Cucumbers, *&c.* Sow Aſparagus. Continue Vermine-traps, and pick up all the Snails you can finde, and deſtroy Frogs and their Spawn.

A good time to ſew Fiſh-ponds, and take Fiſh; the moſt Fiſh being now in ſeaſon.

Hop-garden. Now you may, if the weather prove milde, plant Hops, and dreſs them that are out of heart.

Apiary. Half open your paſſages for Bees; and now may ye remove them.

MARCH.

MARCH.

Day	*Sun riſe.* h.	m.	*Sun ſet.* h.	m.	
1	*David.*				
2	6	15	5	45	
3					
4					
5					
6					
7					
8					
9					
10	6	00	6	00	Sun in *Aries*, Equinoctial.
11					*Arcturus* riſeth in the evening.
12					
13					
14					
15					
16					
17					
18	5	45	6	15	Calf of the right leg of *Bootes* riſeth
19					in the evening.
20					
21					
22					*Spica Virginis* riſeth in the evening.
23					
24					
25	5	30	6	30	*Lady-day.*
26					
27					
28					
29					
30					Second Star in the *left wing of* ♍ ri-
31					ſeth in the evening.

Titan *doth by his preſence now revive*
Things Senſible, as well as Vegetive.

THe beginning of *March* uſually concludes the nipping Winter, the end initiates the ſubſequent welcom Spring; according to the Proverb, *March comes in like a Lyon, and goes out like a Lamb.* If it prove cold, it is ſeaſonable to check the pregnant Buds, and forbid them till a more ſafe and opportune ſeaſon near approaching. If this Month prove dry, the Gountryman counts it Ominous of a happy Year for Corn.

March-Duſt to be ſold, Tuſſer:
Worth Ranſome of Gold.

Let

MARCH.

Let Cattle no longer feed on Meadows nor Marſhes you intend to Mow: have ſpecial regard to the Fences, both of Meadow and Corn.

About the end of this Month you may begin to ſow Barley, earlier in Clay than in Sand. You may now rowl Wheat, if the weather prove dry: make an end of ſowing all ſorts of Pulſe. You may now ſhroud or lop old Trees, and fell Coppice-wood better than at any other ſeaſon in the year.

This is the only time for the raiſing the beſt brood of Poultry.

It is a good time to ſet Oſiers, Willows, and other Aquaticks: ſow the Rye called *March-Rye*.

In this Month, and the next, you may ſow all ſorts of French-Graſſes, or new Hays; as Clover, St. Foyn, *&c.* Alſo now ſow Hemp and Flax, if the weather be temperate.

The principal time of the year for the deſtruction of Moles.

Sow any ſort of white Peaſe, or Haſtings.

Garden and Orchard. This is the principal Month in the year for grafting all ſorts of Fruit-trees. Now cover the roots of all ſuch Trees you laid bare in the Winter preceding, and remove ſuch young Trees you omitted to remove in the better ſeaſon.

Carry Dung into your Gardens, Orchards, *&c.*

Turn your Fruit in the Room where it lies, but open not yet the Windows.

You may now tranſplant moſt ſorts of Garden-herbs, Sweet-herbs, and Summer-flowers; make Hot-beds for Cucumbers, Melons, *&c.* Saffron alſo may now be planted, and Madder.

Now ſow Endive, Succory, Leeks, Raddiſh, Beets, Parſnips, Skirrets, Parſley, Sorrel, Bugloſs, Borrage, Chervil, Sellery, Smallage, Alliſanders, *&c.* Alſo Lettice, Onions, Garlick, Orach, Purſlain, Turneps, Peaſe, Carrots, Cabbage, Creſſes, Fennel, Marjerom, Baſil, Tobacco, Leeks, Spinage, Marigolds, *&c.*

Dreſs up and ſtring your Strawberry-beds; uncover *Aſparagus-beds*, and tranſplant *Aſparagus*; ſlip and plant Artichoaks and Liquorice.

Stake and binde up the weakeſt Plants againſt the winds: ſow Pinks, Carnations, *&c.* In this Month ſow Pine-kernels, and the Seeds of all Winter-greens.

Plant all Garden-herbs and Flowers that have fibrous roots.

Sow choice Flowers that are not natural for our Clime in Hot-beds this Month.

Hop-garden. You may now plant Hops; it is a very ſeaſonable time to dreſs them.

Apiary. Now the Bees ſit, keep them cloſe night and morning, if the weather prove ill. You may yet remove Bees.

APRIL.

APRIL.

Day	*Sun riſe.* h. m.	*Sun ſet.* h. m.	
1			
2	5 15	6 45	
3			
4			
5			
6			
7			
8			
9	5 00	7 00	
10	*Sun in Taur.*		
11			
12			
13			*Cauda Leonis* ſets in the morning.
14			
15			
16			
17	4 45	7 15	
18			
19			
20			
21			
22			
23	*St. George.*		
24			
25	*Mark Evang.*		
26	4 30	7 30	*Vergiliæ*, or *Pleiades*, riſe with the Sun.
27			
28			
29			
30			

Diluculo ſurgere ſaluberrimum eſt.

THe Mornings now ſeem pleaſant, the Days long. The *Nymphs* of the *Woods* in Conſort welcome in *Aurora.*

Hail April, *true* Medea *of the Year,*
That makeſt all things young and freſh appear:
When we deſpair, thy ſeaſonable Showers
Comfort the Corn, and chear the drooping Flowers.

A dry ſeaſon to ſow Barley in is beſt, to prevent Weeds. If *April* prove dry, Fallowing is good.

Fell the Timber you intend to barque; if the Spring be forward, cleanſe and rid the Coppices, and preſerve them from Cattle:

APRIL.

Cattle: keep Geeſe and Swine out of Commons or Paſtures.

Pick up ſtones in the new-ſown Land; ſow Hemp and Flax.

Cleanſe Ditches, and get in your Manure that lies in the Streets or Lanes, or lay it on heaps.

Set Oſiers, Willows, and other Aquaticks, before they are too forwards.

You may throughout this Month ſow Clover-graſs, St. Foyn, and all French or other Graſſes or Hays.

Garden and Orchard.

YOu may yet Graff ſome ſorts of Fruit in the Stock the beginning of this Month.

Now ſow all ſorts of Garden-ſeeds in dry weather, and plant all ſorts of Garden-herbs in wet weather.

Plant French-beans, Cucumbers, Melons, Artichoaks and Madder, and ſow ſuch tender Seeds that could not abide the harder Froſts: ſet French-beans.

Gather up Worms and Snails after evening ſhowres, or early in the morning.

Sow your Annual Flowers that come of Seed, that you may have Flowers all the Summer; and tranſplant ſuch Flowers with fibrous roots you left unremoved in *March:* ſow alſo the ſeeds of Winter-greens.

Now bring forth your tender Plants you preſerved in your *Conſervatory*, except the Orange-tree, which may remain till *May*.

Tranſplant and remove your tender Shrubs; as Jaſimines, Myrtles, Oleanders, *&c.* Towards the end of this Month alſo in milde weather, clip Phillyrea, and other tonſile Shrubs, and tranſplant any ſort of Winter-greens.

Hop-garden. Plant Hops, and pole them in the beginning of *April*, and binde them to the Poles.

Apiary. Open the doors of the Bee-hives, for now they hatch, that they may reap the benefit of the Flowery Spring; and be careful of them.

MAY.

MAY.

Day	*Sun riſe.* h. m.	*Sun ſet.* h. m.	
1	*Phil.* and *Jac.*		
2			*Cor Scorpionis* ſets in the morning.
3			The *Greater Dog-ſtar* ſets in the even-
4			ing.
5			
6	4 15	7 45	
7			
8			The *Goat-ſtar* appears.
9			
10			*Aldebran* ſets in the evening.
11	*Sun in Gem.*		*Fomahant* riſeth in the morning.
12			
13			*Middle-ſtar* of *Andromeda*'s *Girdle*
14			ſets with the Sun.
15			
16	4 00	8 00	
17			
18			
19			
20			
21			*Cor Scorpionis* riſeth in the evening.
22			
23			
24			
25			
26	3 50	8 10	
27			
28			The *Bulls Eye* riſeth with the Sun.
29	K. Charles *his Return.*		
30			
31			

Cuculus canit, quercus in frondibus
Delectantque mortales in immenſa terra.

THis Month Uſhers in the moſt welcome ſeaſon of the Year. Now gentle *Zephyrus* Fans the ſweet Buds; and the Cœleſtial Drops water fair *Flora*'s Garden.

The Lofty Mountains ſtanding on a row,
Which but of late were Perriwigg'd with Snow,
D'off their old Coats, and now are daily ſeen
To ſtand on Tip-toes all in ſwaggering green.
Meadows and Gardens are prankt up with Buds,
And Chirping Birds now Chant it in the Woods:

MAY.

The Warbling Swallow, and the Larks do ſing,
To welcome in the glorious Verdant Spring.

The Countrymans heart is revived (if this Month prove ſeaſonable) with the hopes of a happy *Autumn*; if it prove cold, it is an Omen of good for health, and promiſes fair for a full Barn: the pleaſure of Angling is now in its ſplendour, eſpecially for the *Trout* and *Salmon*.

Now wean thoſe Lambs you intend to have the Milk of their Ewes; forbear cutting or cropping Trees you intend ſhall thrive till *October*; kill Ivy.

If your Corn be too rank, now you may Mow it, or feed it with Sheep before it be too forward: weed Corn. In ſome places Barley may be ſown in this Month.

Now ſow Buck-wheat or Brank; ſow latter Peaſe. Alſo Hemp and Flax may yet be ſown.

Weed Quick-ſets; Drain Fens and wet Grounds; Twifallow your Land; carry out Soyl or Compoſt; gather ſtones from the Fallows; turn out the Calves to graſs; overcharge not your Paſtures, leſt the Summer prove dry; get home your Fewel; begin to burn-beat your Land; ſtub or root out Goſs, Furze, Broom or Fern; and grub up ſuch Coppices, or other ſhrubby woody places you intend ſhould not grow again.

Sell off your Winter-fed Cattle.

About the end of this Month Mow Clover-graſs, St. Foyn, and other French-graſſes. Now leave off watering your Meadows, leſt you gravel or rot your Graſs.

Look now after your Sheep, if this Month prove Rainy, leſt the Rot ſurprize them.

Garden and Orchard. Plant all ſorts of Winter-greens.

Sow the more tender Garden-ſeeds; as Sweet-Marjerom, Baſil, Thime, and hot Aromatick Herbs and Plants: ſet Sage and Roſemary.

Cover no longer your Cucumbers, Melons, *&c.* excepting with Glaſſes: ſow Purſlain, Lettice, *&c.*

At the end of this Month, take up ſuch Tulips which are dried in the ſtalk.

Hop-garden. Binde Hops to their Poles, and make up the Hills after Rain.

Apiary. Watch the Bees now ready to ſwarm.

JUNE.

JUNE.

Day	Sun rise. h. m.	Sun set. h. m.	
1			
2			
3			
4	3 45	8 15	
5			
6			
7			
8			
9			The Head of *Castor* riseth in the morning before the Sun.
10	3 43	8 17	
11	*Barnabas.*		Sun in *Cancer*, Solstice.
12			
13			*Arcturus* sets in the morning.
14			
15			
16			*Hydra's Heart* sets in the evening.
17			
18			
19			
20	3 45	8 15	
21			
22			
23			
24	*John Baptist.*		
25			
26			The *Right Foot of Gemini* sets in the morning.
27			
28			
29	*Peter Apostle.*		
30	3 50	8 10	

Humida Solstitia atque Hyemes Orate Serenas Agricolæ.

A Showre at this time of the year is generally welcome: now *Phœbus* ascends the utmost limits of the *Zodiaque* towards the *Pole-arctick*, and illuminates our most Northern Climes; and makes those Countries that within a few Months seemed to be wholly bereft of pleasure, now to resemble a *Terrestrial Paradise*; and gives unto them the full proportion of his Presence, which in the Winter-past was withdrawn, that they partake equally of his light with the more Southern Countries. The glorious *Sun* glads the Spirit of Nature, and the sweet showres now refresh the thirsty Earth: the Grain and Fruits now shew themselves, to the joy of the Husbandman: the Trees are all in their rich array, and the Earth it self laden with the Countrymans

JUNE.

wealth; if the weather be calm, it makes the Farmer ſmile on his hopeful Crop.

This Month is the prime ſeaſon for the waſhing and ſhearing of Sheep; in forward Meadows Mow Graſs for Hay.

Caſt Mud out of Ditches, Pools or Rivers: this is the beſt time to raiſe Swine for Breeders.

Fallow your Wheat-land in hot weather; it kills the Weeds. *Arrationes eo fructuoſiores ſunt, quo calidiore terra aratur itaque inter ſolſtitium & caniculum abſolvendæ*, ſaith *Varro*.

Carry Marl, Lime and Manure, of what kinde ſoever, to your Land; bring home your Coals, and other neceſſary Fewel fetcht far off, before the Teams are buſied at the Hay-harveſt.

Weed Corn, ſow Rape and Cole-ſeed, and alſo Turnep-ſeed. Now Mildews or Honey-dews begin to fall.

Minde your Sheep, as we adviſed you in *May*.

Garden and Orchard.

NOw begin to Inoculate: beware of cutting Trees, other than the young Shoots of this year: pluck off Buds where you are not willing they ſhould branch forth.

Water the latter-planted Trees, and lay moiſt weeds, *&c.* at the roots of them.

It is a ſeaſonable time to diſtil Aromatick and Medicinal Herbs, Flowers, *&c.* and to dry them in the ſhade for the Winter: Alſo to make Syrrups, *&c.*

Gather Snails, Worms, *&c.* and deſtroy Ants, and other Vermine.

Set Saffron, plant Roſemary and Gilliflowers; ſow Lettice, and other Sallets, for latter Salleting.

Gather ſeeds that are ripe, and preſerve them that are cool and dry: water the dry Beds; take up your bulbous roots of Tulips, Anemonies, *&c.*

Inoculate Jaſumines, Roſes, *&c.* Alſo tranſplant any ſort of bulbous roots that keep not well out of the ground. Now plant ſlips of Myrtle, ſow latter Peaſe.

Hop-garden.

Dig ground where you intend a Hop-garden, and binde ſuch Hops to the Poles the winde hath ſhaken off.

Apiary.

Bees now ſwarm plentifully; therefore be very vigilant over them, they will requite your care.

JULY.

JULY.

Day	*Sun riſe.* h. m.	*Sun ſet.* h. m.	
1			First Star of *Orions Belt* riſes with the
2	*Viſit. of Mary.*		Sun.
3			
4			
5			
6			
7			
8	4 00	8 00	
9			
10			
11			
12			*Lucida Corona* riſeth in the evening.
13	*Sun in Leo.*		
14			
15	*Swithin.*		
16			
17			
18	4 15	7 45	
19	*Dog-days beg.*		*Leſſer Dog-ſtar* riſeth with the Sun.
20	*Margaret.*		
21			
22	*Mary Magd.*		
23			
24			
25	*James Apoſt.*		
26			
27			
28	4 30	7 30	
29			
30			*Greater Dog-ſtar* riſeth with the Sun.
31			*Syrius* riſeth in the morning.

Tempore Meſſis, quando Sol corpus exſiccat
Tunc feſtina, & domum fruges Congrega
Diluculo ſurgens.

IN thirſty *July* would the parched Earth be glad of a moiſtening ſhowre to refreſh and revive the ſcorched Vegetable. Now is there an equal care taken to avoid *Phœbus* his bright and burning Beams, as in the *Winter* the furious blaſts of cold *Boreas*. Tempeſts now injure much the laden Fruit-trees and ſtanding Corn, to the great detriment of the Husbandman.

Now is the Univerſal time for Hay-making; looſe not a good opportunity, eſpecially if fair weather be ſcarce.

Mow your Head-lands; they fallow where the Land requires it: gather the Fimble, or earlieſt Hemp and Flax. At

JULY.

At the latter end of this Month, Corn-harveſt begins in moſt places in a forward year.

Still carry forth Marl, Lime, and other Manure: bring home Timber and Fewel, and other heavy materials.

Wheat and Hops are now ſubject to much damage by Mildews.

Sow Turnep-ſeed in this Month.

Garden and Orchard.

IT is a principal time for the Inoculation of choice Fruits, Roſes, *&c.*

And for the Summer-pruning of your Wall-trees for the making of Cherry-wine, Rasberry-wine, *&c.*

Cut off the ſtocks of ſuch Flowers that have done bloſſoming, and cover their roots with new fat Earth.

Sow Sallet-herbs for latter Salleting; and alſo Peaſe.

Take away the Snails from your *Mural Trees.*

Slip Stocks, and other lignous Plants and Flowers, and lay Gilliflowers and Carnations for encreaſe, watering them, and ſhadowing them from the fervent Sun-beams. Lay alſo Myrtles, and other curious Greens: clip Box, and other Tonſile Plants.

Graff by approach, and Inoculate Jaſimines, Oranges, *&c.*

Tranſplant or remove Tulips, and other bulbous roots: ſome may be kept out of the ground, others immediately planted.

Hop-garden.

If the Seaſon prove very dry, the watering of the Hops will very much advantage them, and make them the more fruitful: if it prove moiſt, renew and cover the Hills ſtill with freſh Mould.

Apiary.

Now Bees caſt their latter Swarms, which are of little advantage; therefore it's beſt to prevent them.

Streighten the entrance of your Bees: Kill the Drones, Waſps, Flies, *&c.*

AUGUST.

AUGUST.

Day	*Sun riſe.* h. m.	*Sun ſet.* h. m.	
1	*Lammas.*		*Orion* appears in the morning.
2			
3			
4			
5			
6	4 45	7 15	
7			
8			*Cor Leonis* riſeth in the morning with
9			the Sun.
10	*Laurence.*		
11			
12			
13	5 00	7 00	Sun in *Virgo.*
14			
15			
16			
17			
18			
19			
20			
21	5 15	6 45	
22			
23			*Canda Leonis* riſeth in the morning
24	*Bartholomew.*		with the Sun.
25			
26			
27	*Dog-days end.*		
28	5 30	6 30	
29			
30			
31			

Non ſemper æſtas erit facite Nidos.

NOw bright *Phœbus*, after he hath warmed our *Northern Hemiſphere*, retires nimbly towards the *Southern*; and the freſh Gales of *Zephyrus* begin to refrigerate the ſcorching Sunbeams: The Earth now yields to the patient Husbandman the fruits of his labours. This Month returns the Countrymans expences into his Coffers with increaſe, and encourages him to another years adventure. If this Month prove dry, warm, and free from high winds, it rejoyceth the Countrymans heart, encreaſeth his gains, and abates a great part of his Diſburſements.

You may yet Thryfallow: Alſo lay on your Compoſt or Soyl, as well on your Barley-land, as Wheat-land.

Carry

AUGUST.

Carry Wood or other Fewel home before Winter.

Provide good Seed, and well picked againſt Seed-time.

Put your Ews and Cows, you like not, to fatting.

This is the moſt principal Harveſt-month for moſt ſorts of Grain; therefore make uſe of good weather whileſt you have it.

About the end of this Month you may Mow your after-graſs; and alſo Clover, St. Foyn, and other French Hays or Graſſes.

Geld Lambs.

Garden and Orchard.

THis is a very good time for Inoculation in the former part of this Month.

You may now make Cider of Summer-fruits; prune away ſuperfluous branches from your Wall-fruit-Trees, but leave not the Fruit bare, except the red Nectorine, which is much meliorated and beautified by lying open to the Sun.

Pull up Suckers from the roots of Trees; unbinde the Buds you Inoculated a Month before, if taken.

Plant Saffron, ſet ſlips of Gilliflowers, ſow Aniſe. Now is beginning a ſecond ſeaſon for the encreaſing and tranſplanting moſt Flowers, and other Garden-plants; as Herbs, Strawberries, *&c.*

The Seeds of Flowers and Herbs are now to be gathered: Alſo gather Onions, Garlick, *&c.*

Sow Cabbages, Colleflowers, Turnips, and other Plants, Roots and Herbs for the Winter, and againſt the Spring.

Now ſow Larks-heels, Canditufts, Columbines, *&c.* and ſuch Plants as will endure the Winter.

You may yet ſlip Gilliflowers, and tranſplant bulbous Roots about *Bartholomew*-tide: ſome eſteem the only ſecure ſeaſon for removing your Perennial or Winter-greens; as Phyllirea's, Myrtles, *&c.* It's alſo the beſt time to plant Strawberries, and it's not amiſs to dreſs Roſe-trees, and plant them about this time.

Hop-garden. Prop up the Poles the winde blows down: Alſo near the end of the Month gather Hops.

Apiary. Toward the end of this Month take Bees, unleſs the goodneſs of the weather provoke you to ſtay till the middle of the next: deſtroy Waſps and other Inſects, and ſtreighten the paſſages to ſecure them from Robbers.

SEPTEM.

SEPTEMBER.

Day	*Sun riſe.* h. m.	*Sun ſet* h. m.	
1	*Giles.*		
2			
3			
4			
5			
6	5 45	6 15	
7			
8	*Nat. of Mary.*		
9			
10			
11			*Arcturus* ſetteth after the Sun.
12			
13	6 00	6 00	Sun in *Libra*, Equinoctial.
14	*Holy Croſs.*		
15			
16			
17			
18			
19			
20	6 15	5 45	
21	*Matthew Ap.*		
22			
23			
24			*Spica Virginis* is with the Sun.
25			
26			
27	6 30	5 30	
28			*Pleiades* riſe in the evening.
29	*Michael Ar.*		
30			

IT is now the *Equinoctial*, that bids adieu to the pleaſant Summer paſt, and ſummons us to prepare for the approaching Winter: the beauty and luſtre of the Earth is generally decaying; our Countrymen and Ladies do now lament the loſs of thoſe beautiful Objects, *Ceres*, *Flora*, and *Pomona*, in their Fields, Gardens and Orchards, ſo lately preſented them withal; but that their minds and hands are buſied in preparing for another return, in hopes of a better Crop. Gentle ſhowres now glad the Ploughmans heart, make the Earth mellow, and better prepare it for the Wheat, which delights in a moiſt Receptacle: ſtill weather, and dry, is moſt ſeaſonable for the Fruits yet on the Trees. The Salmon and Trout, in moſt Rivers, go now out of ſeaſon till *Chriſtmas*.

This Month is the moſt Univerſal time for the Farmer to take

SEPTEMBER.

possession of his new Farm: get good Seed, and sow Wheat in the dirt, and Rye in the dust.

Amend the Fences about the new-sown Corn; skare away Crows, Pigeons, *&c.*

Geld Rams, Bulls, *&c.* sew Ponds: put Boars up in Sty.

Beat out Hemp-seed, and water Hemp; gather Mast, and put Swine into the Woods.

Carry home Brakes; saw Timber and Boards; manure your Wheat-lands before the Plough.

Garden and Orchard. YOu may now make Cider and Perry of such Fruits as are not lasting, and gather most sorts of Winter-Pears, and some sorts of Winter-apples; but gather not long-lasting Fruit till after *Michaelmas.*

Sow Cabbages, Colleflowers, Turnips, Onions, *&c.* Now transplant Artichoaks, and Asparagus-roots, and Strawberries, out of the Woods: plant forth your Cabbages and Colleflowers that were sown in *August*, and make thin the Turnips where they grow too thick.

Now plant your Tulips, and other bulbous roots you formerly took up, or you may now remove them: you may also transplant all fibrous roots.

Now retire your choice Plants into the Conservatory, and shelter such Plants that are tender, and stand abroad.

Towards the end of this Month may you gather Saffron.

Hop-garden. Now finish the gathering and drying of your Hops; cleanse the Poles of the Hawm, and lay up the Poles for the next Spring.

Apiary. Take Bees in time; streighten the entrance into the Hives; destroy Wasps, *&c.* Also you may now remove Bees.

OCTOBER.

OCTOBER.

Day	*Sun riſe.* h. m.	*Sun ſet.* h. m.	
1			
2			
3			*Spica Virginis* riſeth in the morning
4	6 45	5 15	with the Sun.
5			
6			
7			
8			
9			
10			
11			
12	7 00	5 00	
13			
14	*Sun in Scorp.*		
15			
16			*Cauda Leonis* ſets in the evening.
17			
18	*Luke Evan.*		
19			
20	7 15	4 45	
21			
22			
23			
24			
25	*Criſpine.*		
26			
27			
28	*Sim.* and *Jude.*		
29	7 30	4 30	
30			
31			

Phœbus *withdraws his Luſtre, and his Rays*
He but obliquely on the Earth diſplays.

NOw enters *October*, which many times gives us earneſt of what we are to expect the Winter ſucceeding: that I may ſay;

The Sun *declines, and now no comfort yields*
Unto the fading Off-ſpring of the Fields.
The Tree is ſcarce adorn'd with one wan Leaf,
And Ceres *dwells no longer at the Sheaf.*

If it prove windy, as it uſually doth, it finiſhes the Fall of the

OCTOBER.

Leaf; and alſo ſhatters down the Maſt and other Fruits, leaving neither Leaf nor Fruit.

Lay up Barley-land as dry as you can: Seed-time yet continues, and eſpecially for Wheat.

Well water, furrow, and drain the new-ſown Corn-land: now is a good time for the ſowing of Acorns or Nuts, or other ſort of Maſt or Berries for Timber, Coppice-wood, or Hedges.

Sow Peaſe in a fat and warm Land: you may plant Quick-ſets, and alſo all ſorts of Trees for Ornament, or for uſe; and alſo plaſh Quick-ſets.

Wean the Foals that were foaled of your Draught-Mares at Spring: put off ſuch Sheep as you have not wintering for.

Follow Malting; this being a good time for that work.

Garden and Orchard.

MAke Cider and Perry of Winter-fruits throughout this Month.

Now is a very good time for the planting and removing of all ſorts of Fruit-trees, or any other Trees that ſhed their Leaf.

Trench the ſtiffer grounds for Orcharding and Gardening, to lie for a Winter-mellowing. Now lay open the roots of old and unthriving Trees, or ſuch that ſpend themſelves too much, or too ſoon in bloſſoms.

Gather the reſidue of the Winter-fruits; alſo gather Saffron.

Sow all ſorts of Fruit-ſtones, Nuts, Kernels and Seeds, either for Trees or Stocks.

Cut and prune Roſe-trees. Many of *September*-works may yet be done, if the Winter be not too forward.

Now plant your bulbous Roots of all ſorts, and continue planting and removing ſeveral Herbs and Flowers with fibrous roots, if the former and better ſeaſon be omitted.

Hop-garden. This Month is the beſt time to plant Hops: Alſo may you bag or pack thoſe you dried the laſt Month.

Apiary. Now you may ſafely remove Bees.

NOVEM-

NOVEMBER.

Day	*Sun riſe.* h. m.	*Sun ſet.* h. m.	
1	*Alhallontide.*		
2			
3			
4			
5	*Powder-plot.*		
6	7 45	4 15	*Leonard.*
7			
8			
9			*Virgiliæ*, or the *Seven Stars* ſet in the
10			morning.
11	*Martin-mas.*		The *Bulls Eye* ſets in the morning.
12	*Sun in Sagit.*		
13			
14			
15			
16	8 00	4 00	*Edmund.*
17			
18			
19			
20			
21			
22			*Cor Scorpii* riſe in the morning.
23			
24			
25			Laſt three bright Stars in the middle
26	8 10	3 50	of *Scorpio* riſe in the morning.
27			The *Bulls Eye* riſeth in the evening.
28			
29			The Middle-ſtars of *Andromeda's* Gir-
30	S. *Andrew Ap.*		dle riſe in the morning.

------- *Hyems Ignava Colono.* Virgil.

November generally proves a dirty Month, the Earth and Trees wholly uncloathed. Sowing of Wheat and Rye on a concluſion: the Countryman generally forſakes the Fields, and ſpends his time at the Barn, and at the Market. A good fire begins to be welcome.

Wheat may yet be ſown on very warm and rich Lands, eſpecially on burn-baited Land.

Fat Swine are now fit for ſlaughter: leſſen your Stocks of Poultry and Swine.

Thraſh not Wheat to keep until *March*, leſt it prove foiſty.

Lay Straw, or other waſte Stuff in moiſt places, to rot for Dung: Alſo lay Dung on heaps.

Fell

NOVEMBER.

Fell Coppice-woods, and plant all ſorts of Timber, or other Trees: fell Trees for Mechanick uſes; as Plough-boot, Cart-boot, *&c.*

Break Hemp and Flax.

Now may you begin to overflow or drown your Meadows that are fed low.

Deſtroy Ant-hills.

Garden and Orchard.

PEaſe and Beans may now be ſet; ſome ſay Garlick: alſo trench or dig Gardens.

Remove and plant Fruit-trees; furniſh your Nurſery with Stocks againſt the Spring.

Yet may you make Cider of hard fruits that are not pulpy.

Prune Trees; mingle your rich Compoſt with the Earth in your Orchards againſt the Spring.

Some very hard Fruits may yet be gathered.

Lay up Carrots, Parſnips, Turnips, Cabbages, Colleflowers, *&c.* either for your uſe, or to tranſplant for Seed at the Spring: cover the Aſparagus-beds, Artichoaks, Strawberries, and other tender Plants, with Long-dung, Horſe-litter, Straw, or ſuchlike, to preſerve them from the bitter Froſts. Alſo dig up Liquorice.

Now is the beſt ſeaſon to plant the faireſt Tulips, if the weather prove not very bitter.

Cover with Mattreſſes, Boxes, Straw, *&c.* the tender Seedlings.

Plant Roſes, Lilac, and ſeveral other Plants and Flowers, the weather being open.

As yet you may ſow Nuts, Stones, *&c.*

Hop-garden. Now carry Dung into your Hop-garden, and mix it with ſtore of Earth, that it may rot againſt the Spring.

Apiary. You may this Month ſtop up your Bees cloſe, ſo that you leave breathing vents; or you may houſe them till *March.*

DECEM-

DECEMBER.

Day	*Sun rise.* h. m.	*Sun set.* h. m.	
1			
2			
3	8 15	3 45	
4			*Right foot of Gemini* sets in the morn.
5			The *Lesser Dog-Star* sets in the morn.
6			
7			
8			
9			
10			
11			
12	8 17	3 43	Sun in *Capricorn*, Solstice.
13			*Arcturus* sets in the evening.
14			
15			
16			*Cor Hydræ* sets in the morning.
17			
18			
19			
20	8 15	3 45	
21	*Thomas Ap.*		
22			
23			
24			
25	*Christmas.*		Right shoulder of *Orion* riseth in the
26	*St. Stephen.*		evening.
27	8 10	3 50	St. *John Evangelist.*
28	*Innocents.*		
29			
30			The left foot of *Gemini* rises in the
31			evening.

PHæbus now leaves us the shortest Days and longest nights, is newly entred *Capricornus*, the most Southern Celestial Sign, and begins his Annual Return; which very much rejoyceth the Countrymans heart, to see a lengthening of the day, although accompanied with an increase of Cold. The Earth is generally fast locked up under its frozen Coat, that the Husbandman hath leisure to sit and spend what Store he hath before-hand provided.

Frigoribus parto agricolæ plerumque fruuntur,
Mutuaque inter se læti convivia curant.

Now is it time to house old Cattle: cut all sorts of Timber and other Trees for Building, or other Utensils: fell Coppices.

Plant

DECEMBER

Plant all sorts of Trees that shed their Leaf, and are Natural to our English Clime, and not too tender.

Let Horses blood: fat Swine, and kill them.

Plough up the Land for Beans; drain Corn-fields where water offends, and water or overflow your Meadows.

Destroy Ant-hills.

Garden and Orchard.

YOu may now let such Fruit-trees as are not very tender, and subject to the injury of the Frost.

Also transplant any sort of Fruit-trees in open weather: Plant Vines, and other Slips and Cions, and Stocks for Grafting.

Prune Vines if the weather be open.

Cover the Beds of Asparagus, Artichoaks and Strawberries, *&c.* with warm Horse-litter, Straw, *&c.* if not covered before.

Sow Beans and Pease if the Winter be moderate: trench ground, and dress it against the Spring.

Set Traps for Vermine, and pick out Snails out of the holes of walls, *&c.*

Sow or set Bay-berries, Laurel-berries, *&c.* dropping ripe.

This Month may you dig up Liquorice.

Hop-garden. Dig a weedy Hop-garden, and carry Dung into it, and mix it with Earth.

Apiary. Feed weak Stocks.

Annus in Angue latet.

CHAP.

CHAP. XIV.

Of the Prognoſticks of Dearth or Scarcity, Plenty, Sickneſs, Heat, Cold, Froſt, Snow, Winds, Rain, Hail, Thunder, &c.

WE have in the precedent Diſcourſe diſcovered unto you the Reaſons of, and the beſt, neweſt, and moſt Rational Methods and ways, for the better improvement of any ſort of Lands capable thereof; and have alſo given you a *Kalendar* of the moſt ſelect Times and Seaſons in the Year, for the performance of moſt of *Rural Affairs* abroad; and alſo an account of the Riſing, Setting, *&c.* of ſeveral of the Fixed Stars, formerly obſerved by the *Ancients* in ordering their Ruſtick Affairs. Yet remaineth there a more peculiar Art or Science, equally neceſſary with (if not more than) any of the former; and that is to foreſee or underſtand what ſhall or may probably be, before it comes to paſs; which is of ſo great concernment, that could men but attain to it, that alone were Art enough, not only to raiſe their own Fortunes, but advantage the whole Kingdom, by laying up ſtores in time of plenty, to ſupply the defects of ſcarcity.

That there is ſuch fore-knowledge in ſome meaſure attainable from the Natural Significations or Prognoſtications of *Comets*, unuſual *Meteors*, *&c.* is moſt evident, becauſe they are either Providentially placed as Signes, which muſt ſignifie ſomewhat to come; or they are natural or accidental cauſes of ſome extraordinary and unuſual effects that always ſucceed ſuch rare Appearances. If we ſhould deprive *Man* of this Spirit, or Art of fore-ſeeing or judging of future things from evident Signs and Tokens, we ſhould inſtead of making him more excellent, ſet him a degree below the Beaſts, and other Animals; who not only foreſee the different changes of the Times and Seaſons, but alſo prepare for them, as in the ſubſequent diſcourſe will be made appear.

Solers Natura, & rerum genitabilis Ordo, Avien.
Certa ſuis ſtudiis affixit ſigna futuri.

So that we are not naturally uncapable of foreſeeing what is to be, but we are prejudiced againſt the thing it ſelf, becauſe ſuperſtitious people (and blinde as to things Divine) have in ſeveral Ages doated ſo much upon their own attainments in this Art, that inſtead of making a lawful uſe thereof, they have Religiouſly interpoſed it between themſelves, and the true and living

Spirit, which hath begotten ſo great a prejudice againſt the thing it ſelf, becauſe of the abuſe thereof, that it is generally deſerted and neglected; and thoſe that have any the leaſt judgment or inſight therein, much ſcorned and ſlighted by the vulgar and ignorant ſort of people.

Which notwithſtanding, (leaving the more Sublime Method of Predicting things to come in the greater Sphere, not at all conducing to our intentions, nor within our Ruſtick capacity to write of or apprehend) we will give a brief account of the common and natural ſignifications of uſual ſigns and tokens of *Heat*, *Drought*, *Cold*, *Rain*, *Tempeſts*, *&c.* on which depend, and from which uſually proceed *Plenty*, *Scarcity*, &c. of *Corn*, *Hay*, &c. or the *ſickneſs* or *welfare* of *Men*, *Beaſts*, &c. All which are very neceſſary for our Countryman to underſtand; and, I hope, free from any thing of Superſtition or Irreligion.

------ *Qui hæc omnia*
Sciens operatus fuerit, inculpatur diis,
Auguria obſervans, & delicta evitans.

SECT. I.

Of the different Appearances of the Sun, Moon, Stars, Meteors, *or any other thing in the Air, or above us.*

Of the motions, colours, and appearances of the ſeven Planets.

The moſt principal of natural cauſes of all changes and variations of the ſeaſons of the year, and of the different degrees of Heat, Cold, Drineſs, Moiſture, *&c.* in thoſe ſeaſons, are firſt the *Sun*, then the *Moon*, and other of the moveable *Stars* or *Planets*; but more eſpecially the *Sun*, whoſe diſtance or nearneſs unto us, or rather whoſe Obliquity or Perpendicularity, in reſpect of any part of this Globe, doth beget that moſt apparent variety in the different ſeaſons, which indeed would be certain, were there not intervening cauſes that did divert the general influence of the *Sun*, and ſometimes aggravate, and ſometimes impede the extreams of weather, *&c.* occaſioned by it: But let thoſe alterations in the *Air*, or above us, be what they will, there are ſome certain *Prodromi* that give us to underſtand thereof, and none more than the *Sun*, as principal in the Heavens: next unto it the *Moon*; as *Virgil:*

Si vero Solem ad rapidum, Lunaſque ſequentes
Ordine reſpicies; nunquam te craſtina fallet
Hora.

Of the Sun.

The *Sun* doth indicate unto us the true temperament of the *Air*, through which we receive its beams; and according to its *denſity* or *rarity* thereof do we perceive that *Luminous Globe*; as if the *Air* be ſerene and clear, then do we moſt perfectly receive the beams of the *Sun*: the weather is then moſt inclinable

to

to drineſs, and according to the winde, ſo is it either hot or cool; which if it be either *Eaſt* or *North-Eaſt* in the fore-part of the *Summer*, the weather is like to continue dry; and if *Weſtward* towards the end of the *Summer*, then will it continue alſo dry: but upon the approach of Rain, the *Air* is uſually repleat with moiſt Vapours, which are not of themſelves ſo evidently diſcernable to the eye, and yet are plainly demonſtrated by the *Sun*.

Sol quoque & exoriens, & cum ſe condet in undas Virgil.
Signa dabit: Solem certiſſima ſigna ſequentur.

Before Rain, the *Sun* appears dim, faint and watriſh; which preſageth Rain to follow.

At the riſing of the *Sun*, if it appear red or pale, and afterwards dark, or hid in a black watry Cloud, Rain follows; or if the Sun-beams appear before the Sun-riſing, or a watry Circle about the *Sun* in the morning; or if the *Sun* appear hollow, or have red or black Clouds about it at the riſing; or if the Beams be faint, or ſhort, or watriſh; *Suſpecti tibi ſint Imbres*— Rain uſually follows: For the Air being pregnant with moiſture, which uſually precedes Rains, *&c.* doth repreſent the *Sun* and Sun-beams, different in form and colour from what it appears to be at other times; as ſome ſorts of Glaſs being interpoſed, doth repreſent Objects different from what they are.

At ſi cum referetque diem, condetque relatum, Virgil.
Lucidus orbis erit; fruſtra terrebere nimbis.

The ſetting clear and red, and riſing grey, and afterwards clear of the Sun, indicates a fair day to follow.

The appearance of the Sun being very red at any time, but eſpecially in the evening, Winde ſucceeds.

Cæruleus pluviam denunciat, Igneus Euros. Virgil.

Any redneſs in the Air precedes winds; which colour is cauſed from the more coagulated or digeſted viſcous moiſture, than that which cauſeth Rain, from which coagulated or digeſted moiſture winds are uſually generated; but the cauſe of the redneſs above any other colour, is the ſame as it is in ſome Glaſſes and Tranſparent Stones, which although perfectly white, repreſent Objects (alſo white) yet red unto our eyes, as well as other colours: The reaſons thereof I leave to the more Learned to diſcuſs.

The ſame denſity or coagulation of the Air alſo repreſents the Matutine or Veſpertine *Sun* or *Moon* larger unto our ſight than at other times, and uſually precedes winde; and the reaſon why theſe Orbs appear greater in the morning or evening than at other times is, becauſe there is more of this denſe Air

interposed between the object and the sight then, than at any other time.

Of the Moon. The most principal Significator of the varieties of weather, the Countryman esteems the Moon to be, not only from its Configurations and Aspects with the Sun and other Planets, which old-fashioned Astrologers and ignorant Philosophers have put into their heads; as that the Change, Full, *&c.* being in such and such Signes, such weather shall follow; which if true, then should we have the weather every year alike, (the same Aspects falling out very near the same time every year) which every Country-*Coridan* can contradict.

But also from its Prognosticks of the several changes of weather from its colour and appearance to our eyes, which are more certain and useful for us to follow: the same Rules concerning the different appearances of the Sun, may also serve for the Moon, being all from the same cause.

If one Circle appear about the Moon, it signifies Rain.

But if more Circles appear, they signifie Windes and Tempests to follow.

Also if the Horns of the Moon appear blunt or short, it signifies a moist Air, and inclinable to Rain.

But that Vulgar Errour of the hanging or tending of the Horns this or that way, to presage any alteration of weather, is wholly to be rejected, every year they tending the same way, at the same time of the year: and also that errour of judging the weather for that Moon, by what it is two or three days after the Change; which only demonstrates the Natural inclination of the Air at that time: the same Rule may be observed at any other time of the Moon.

Of the other Erraticks or Planets. The different Aspects of the Planets one with the other, and also Eclipses, do undoubtedly either occasion or predict various Mutations and changes in most of our Sublunary Affairs, and more especially in this of the weather: But the ignorance and sordidness of men is such, that they only relie upon the Rules and Precepts of the *Ancients*, and conceive them to be perpetual, when the Aspects of these Planets vary *ad infinitum*, and so of necessity must the effects. Also, those Authors made those Observations in such Countries where the seasons and variations of weather more exactly followed the Celestial Configurations, than in these more oblique Climates, where there are other concomitant causes intermixed: so that men ought rather to study and observe the different effects in these parts and times from those in other Countries, and also the occasions of such differences, rather than to presume too much upon uncertain Rules and Methods; which begets scorn and derision in the Ignorant, who are the only Enemies to Art.

Scientia non habet Inimicum, præter Ignorantem.

And frustrates the expectations, and discourages the Ingenious:

For undoubtedly *Eclipses*, *Conjunctions*, *Oppositions*, *&c.* have some influence on this Globe, though we apprehend them not as we might.

These unusual and extraordinary appearances above us, are undoubtedly ingendred or formed of some Vapours and viscous matter congealed or coagulated, and congregated together into a certain *Mass* or *Lump*; which being more remote from us than the Clouds, are represented to our sight through the perspicuous Body of the Air, to be round. Their motion is always irregular and uncertain; and according to their substance, whether more or less gross or subtil, so do they appear either clearer or dimmer to the eye: they are never so dense or gross, but that the Beams of the Sun penetrate them; which are evidently conspicuous in the clear and dark nights, except the light of either Sun or Moon be near it; then the tail (as they usually term it) or Beams of the Sun penetrating it, are lost or much diminished. *Of Comets, or Blazing-stars.*

The matter whereof they are compounded or formed is various, according to the part or places of the world from whence they were extracted: also their digestion or Coagulation is more in some than in others, which manifestly appears by their different colours and substances, and also from their effects, which only operate in those parts of the World where they resolve themselves again.

They neither flame nor burn, as is fabulously supposed, but move as other Meteors do, from a certain expence of their own substance the one way, which inforceth their motion another.

When they are spent, the matter whereof they are compounded doth tend to this Globe, as all other substances do within the *Magnetick* or *Attractive* power thereof: so that on what part or Country of this Globe the matter resides, there may they expect the effects thereof, which are various.

Sometimes great Rains succeed, as it was after the Comet in 584. that it was then believed a second Deluge or Universal Floud to have been prepared for the drowning of the whole World.

Sometimes also great heat and drought, as did the next Summer after the Comet in 1472 in *January*; which was of such strength and vehemency, that in some places the fire burst out, *&c.* Also there followed mortal Maladies, loathsome Sicknesses, most noysom and infectious, *&c.* (in *Germany*:) of which nature that Comet seemed to be, that appeared to us in *England*, in *December* 1664. after which succeeded great drought, heat, and want of Rain, and that great and terrible Plague in 1665. and great heat and drought, and Pestilential Diseases in 1666, and 1667. and that never-to-be-forgotten Fire or burning of *London*.

At si contigerit plures Ardere Cometas,
Invalidas segetes torrebit saepius Aer. Avien.

More

More might be said, both as to their Causes, Motions and Effects; but as it belongs to higher Capacities than our Country-Reader to apprehend, so it requires the able Pens of more Sublime Philosophers to treat of.

Of the Shooting of Stars.

There are certain lesser Meteors that never attain to the magnitude of Comets, yet seem to be composed of the same matter, and to produce like effects, though in a far less degree: they are visible only in their motion, and seem as though streams of fire issued from them: As the Poet saith;

Sæpe etiam stellas, Vento impendente, videbis
Præcipites Cœlo labi, noctisque per umbras,
Flammarum longos à tergo albescere tractus.

Which are no otherwise fire than the dashing of Salt-water in a dark night, or the moist light of several Marine Creatures, or of shining wood, or of the scraping of Loaf-sugar in the dark.

The light proceeding from these Meteors, is meerly from the expence of their matter by the swiftness of their motion; which matter being dissipated, descends nearer unto this Globe, and afterwards becomes the cause from whence Winds, Rain, Mists, or Fogs proceed; according as the matter is more or less in quantity, or more or less gross or subtil in substance; as is evident from every Countrymans Observation and Experience.

Of the Fixed Stars.

The *Ancients* relied much on the rising, setting, and appearing of the Fixed Stars: *Virgil.*

Præterea tam sunt Arcturi sidera nobis,
Hædorumque dies servandi, & Lucidus anguis, &c.

On which days depended their most principal Rules of *Agriculture*; but it was in those parts, or Climates, as we said before, where times and seasons were not subject to so great a variation, as in these.

We therefore need observe no more than their appearances, as they are visible unto us; that is, whether they be clear or dim, or whether they seem to be more or fewer in number than they usually do, *&c.*

If any of the greater Stars seem to have a Circle about them, or twinkle, or appear greater than usual, or appear dim, or their Rays blunt, or appear fewer in number, you may expect Rain, the Air being inclinable thereunto.

Also if they appear very thick, and more in number than usual, it indicates the Air to be rare and thin, and the more capable of Rain; and also Prognosticates tempestuous weather to follow.

Of Fire, or other casual appearances.

From the same cause as Comets or Shooting-stars, may also flashes of fire in several forms be produced; which may also presage or signifie the same things to come.

But they are usually more terrible, and from more strong causes,

ſes, and do uſually produce more violent effects; as fierce Tempeſts, *&c.*

Quod ſi diverſis ſe paſſim partibus ignes Avien.
Excutiant : Verret pelagus ſine fine modoque
Turba procellarum.-----

If theſe flaſhes appear in the form of Lightning, without either Clouds or Thunder, Winds and Rain uſually ſucceeds from that Coaſt the light is obſerved; if from ſeveral Coaſts, great Tempeſts follow.

If the Air ſeem to be lighter than at other times, the Sun and Moon being remote, it denoteth Winds and Rain to follow.

Before Great Sickneſſes, or Peſtilential Diſeaſes, lights in the Air, *&c.* have been obſerved.

Alſo the *Clouds* themſelves, as they vary in form and colour, or motion, do indicate unto us the weather we are to expect. *Of the Clouds.*

In a clear evening, certain ſmall black *Clouds* appearing, are undoubted ſigns of Rain to follow; or if black, blew, or greeniſh *Clouds* appear near the Sun at any time of the day, or Moon by night, Rain uſually follows.

In a fair day, if the Sky ſeem to be dapled with white *Clouds*, (which they uſually term a Mackarel-Sky) it uſually predicts Rain.

If great black *Clouds* come out of the *North*, and appear whitiſh when nearer to you, and the ſeaſon be cold and dry, it ſignifies Snow or Hail.

If *Clouds* be very high, and move another way than the winde blows, or than the other *Clouds* move that are lower, the winde either riſeth or turneth.

If they appear like Flocks of Sheep, or of a red colour, winde alſo follows.

If ſmall watriſh *Clouds* appear on the tops of hills, Rain follows, as they obſerve in *Cornwal.*

When Hengſten *is wrapped with a Cloud, a ſhowre follows ſoon after.*

The like they obſerve of *Roſeberry-topping* in *Yorkſhire*, and many other places in *England.*

If *Clouds* move towards the Sun, it denotes Winde and Tempeſt.

If *Clouds* reſt over the Sun at Sun-riſing, and make as it were an Eclipſe, it portendeth Windes; if from the *South*, Windes and Rain.

If in a clear day ſingle *Clouds* fly apace, Windes are expected from that place whence they come.

If *Clouds* grow or appear ſuddenly, the Air otherwiſe free from *Clouds*, it ſignifies Tempeſts at hand, eſpecially if they appear towards the *South* or *Weſt.*

Miſts and *Fogs* are of divers natures; ſome are the effects of Shooting-ſtars, and other Meteors; and theſe are more general: *Of Miſts and Fogs.*

ſome-

ſometimes they are very groſs and ſtinking; they are then to be avoided as much as you can: their ſignifications, as to the change of Air, are various; if they vaniſh or fall without a Winde, fair weather uſually ſucceeds.

The white *Miſts* that uſually aſcend in a morning from the low grounds in a clear Air, if they vaniſh, or ſettle again in the Valleys, fair weather ſucceeds: but if they take to the Hills, or Mount aloft, it demonſtrates the watry inclination of the Air; therefore expect Rain.

Of Windes. In the more Southerly Regions, the Windes are much more certain than in theſe, and the effects of them alſo more certain: For notwithſtanding the Rules and Obſervations of our *Engliſh Philoſophers*, as to the ſtrict place of the Winde, expecting thence a certain effect, you will finde ſuch Fancies to deceive you: For although the Winde being exactly in the *South South-Eaſt* Point, it Rains to day, yet another day the Winde may be in the ſame place, and it be fair weather. Alſo that Winde that brings Rain to the one part of this Iſland, may not to another: for I obſerve the Propinquity of the Sea is to be conſidered, every place lying nearer to ſome one part of the Sea than another; and on which Coaſt the Sea is neareſt, that Winde more frequently brings Rain to that place, than to another where the Sea is more remote: Therefore I deſire all ſuch that expect any ſucceſs to their Obſervations, that they quadrate the Rules to the places where they live, and not truſt to the Obſervations of other places.

Windes alſo are of different qualities, according to the ſeveral places they either proceed from, or paſs over; as the *Eaſt-winde* is counted propitious neither to Man nor Beaſt, which I judge partly to be from the Fens or moiſt Countries; as *Holland*, the Fens in *Yorkſhire*, *Lincolnſhire*, *Cambridgeſhire*, *&c.* from whence Windes uſually proceed, and muſt of neceſſity prove unwholeſome both to Man and Beaſt, except to thoſe that inhabit on the Weſtern Coaſt; for the Winde hath ſufficiently purged it ſelf by paſſing over ſo much Land, as to leave its noxious quality behinde it.

Alſo the *Northern Windes* are more ſerene with us than the other: one cauſe, I ſuppoſe, is from the quantity of Land in *Scotland* and *England* it comes over unto us, as is obſerved in other Countries, that from the *Continent* the coldeſt and moſt ſerene Windes proceed.

If the Winde turn to the *South* from any other *Coaſt*, or remove from the *South* having been long there, it uſually brings alteration of weather.

Windes do produce ſeveral and various alterations and effects in the Air, in the Water, and in the Bodies of Men and Beaſts; as the *South* and *Weſt-windes* are uſually more hot and moiſt, and not ſo clear as the other; the *North* and *Eaſt* are more clear, dry and cold.

Bacon *de ventis.* When the *South-winde* blows, the Sea is blew and clear; but when

when the *North-winde*, it is then black and obſcure.

The *Eaſtern-windes* uſually make our freſh waters much clearer than the *Weſt*.

The *North-winde* is beſt for ſowing of Seed, the *South* for Grafting or Inoculations.

The *South-winde* is the worſt for the bodies of men; it dejecteth the appetite, it bringeth Peſtilential Diſeaſes, increaſeth Rheums; men are more dull and ſlow then, than at other times: Beaſts alſo are not to be exempted from theſe influences.

The *North-winde* makes men more chearful, and begets a better appetite to meat; yet is injurious to the Cough, Ptiſick, and Gout, and any acute Flux.

The *Eaſtern-winde* is drier, more biting, and deadly.

The *Weſt-winde* is moiſt, milde and calm, and friendly to all Vegetables. The *Eaſt-winde* blowing much in the Spring, injureth Fruits by breeding Worms.

All Windes blowing much cleanſe the Air; ſtill and quiet Summers being the moſt unwholeſome, and ſubject to Peſtilential and Epidemical Diſeaſes.

If in great Rains the Windes riſe or fall, it ſignifies that the Rain will forthwith ceaſe.

If the Winde vary much in few hours, and then be conſtant to one place, it ſignifies the Winde to continue long in that place.

If at the beginning of the Winter the *South-winde* blow, and then the *North*, it is like to be a cold Winter; but if the *North-winde* firſt blow, and then the *South*, it will be a warm and milde Winter.

The blowing of the Windes from ſeveral Coaſts (other concomitant cauſes concurring) are the trueſt Preſignificators of Thunder.

The blowing of the Windes aloft, with a murmuring or hollow noiſe more than below, commonly preſageth Rain.

The blowing or compreſſion of the Windes downwards cauſing ſmoak to deſcend, *&c.* more than uſual, ſignifies Rain to follow.

If the Windes blow directly downward, and cauſe a motion on the water ſeveral ways, or force the duſt to ariſe with the Winde, which is repercuſſed by the Earth; if they alſo inforce the Hay, Corn, or other things in the Fields, up aloft into the Air, which denote unto us the craſſitude of the Vapours in the Air, which by the heat of the Sun do emit ſuch caſual blaſts; for they rarely happen but in the *Summer*, and the day-time, (yet ſometimes when no *Cloud* is near) they ſignifie Winde, and ſometimes Rain to ſucceed, other cauſes concurring, or otherwiſe extream heat. *of whirlwindes.*

But if theſe Whirl-windes are very great, they preſage Tempeſts to be very nigh; as *Virgil.*

Omnia Ventorum concurrere prælia vidi;
Quæ gravidam late ſegetem ab radicibus imis

Sublime expulsam eruerunt; ----
----- *Immensum Cœlo venit agmen aquarum*, &c.

Of the Rainbow.

This watry *Meteor*, and the greatest Miracle in Nature, (besides its Divine signification) being produced of natural causes, hath also its natural effects. In some Countries more *Southward*, it's an ordinary Presage of great Tempests at hand; but here various weather succeeds, according to it's various appearances and colours.

It is the lowest of Meteors (saith *Bacon*) and when it appears in parts, and not whole or conjoyned, it produceth Windes and Rain.

If it appear double or triple, it usually presageth Rain.

If the colours thereof tend more to red than any other colour, Winde follows; if green or blew predominate, then Rain.

Of noise and stilness in the Air.

The Audibility of Sounds are certain Prognosticks of the temper of the Air in a still Evening: For if the Air be repleat with moisture over us, it depresseth Sounds, that they become Audible at a far greater distance than when the Air is free from such moisture or vapours; as you may observe in Building, the lower and more ponderous the Roof or Floor next you is, the farther and plainer may you hear any thing therein; which is the true cause of the quick hearing, at the whispering-place in *Glocester-Cathedral*; which is not only from the closeness of the passage, as is generally conceived, but from the weight and Massiness of the building over it. The like I have observed in Rooms covered with Lead, Stone, *&c.* and in places under large Cisterns of water.

From whence you may conclude, that in such nights or other times that you hear sounds of Bells, noises of Water, Beasts, Birds, or any other sounds or noises more plainly than at other times, the Air is inclinable to Rain, which commonly succeeds.

Of Ecchoes.

The same may be said of *Ecchoes*, as of other noises and sounds.

Of Thunder and Lightning.

When it Thunders more than it Lightens, it signifies great Windes; but if it Lighten oftner than it Thunders, it signifies great and hasty showres.

Morning-Thunders signifie Winde, Noon-Thunders Rain, roaring or distant Thunders signifie Winde; but cracking or acute Thunders, Windes and Rain.

Of the rarity and density of the Air.

According to the Opinion and Rules of others, and our own Observations, we have given you the best and most probable indications of the future changes of the Winde, Weather, *&c.* from the several and usual appearances above, either certain or uncertain, or accidental. Now it remains that we say somewhat in relation to the temper or qualification of the Air it self, deducted from its own being more rare or expanded, or more dense or contracted.

We ſhall not take any further notice of the nature of the Air in this place, than it ſerves to our preſent intention, which is only to demonſtrate unto you, that the Air is an abſolute Body, fluid and tranſparent, and in ſeveral particulars like unto the water, both being penetrable alike by their ſeveral Inhabitants; the Fiſh with an equal facility piercing the waters, as Fowls do the Air: they are both Nutriments to their ſeveral Animals reſiding in them; they both obſtruct the Viſual Faculty alike, as they are more or leſs denſe; they are both ſubject to Expanſion or Contraction, but the Air more; they are both ſubject to Undulation, as they are fluid.

The Air is alſo capable to ſupport great burdens, as the vaſt quantities of water that flow over our heads in ſtormy or rainy weather, which, according to the rarity and denſity of the Air, do *gradatim* diffuſe themſelves upon the Earth; as is moſt evident in the more hot and Southerly Countries, where the Air is more hot and thin, there Rain falls with that violence, as though it were water poured forth; when in the more Northerly, where the Air is more denſe or groſs, it diſtils in minute drops, as it were cribrated through the thick Air. We alſo may diſcern a manifeſt difference; for in the warmer ſeaſons of the year, the Air being then moſt thin, the Rain falls in greateſt drops; and in the colder ſeaſons, when the Air is more denſe, the Rain diſtils in ſmaller.

So that when the waters are above us, or that Clouds or Floods of water are in being in the Air, we have only to judge whether they incline towards us, or that they are for ſome other place.

This rarity or denſity of the Air cannot be judged by the ſight; for it is uſual when the Air it ſelf is moſt rare, then is it moſt repleat with vapours, *&c.* as water, the more it is heated, the leſs tranſparent it becomes.

Neither can it be judged by its weight, as many do imagine and affirm from Fallacious Experiments; for the Air is not ponderous in its own proper place, no otherwiſe than water is in the Sea in its proper place; although it be aſſerted by High-flown Philoſophers, and Learned Pens, with whom it is beſides our Primary intentions to contend in this place, it being enough here to diſcover to our *Country-Reader* theſe myſterious Intricacies of Nature (as they would have them eſteemed) by familiar Examples and Demonſtrations.

Of Thermometry or the weather-glaſs.

For the true diſcovery of the nature and temper of the Air, as to its denſity or rarity, we have not met with a more certain or compleat Invention than the *Weather-glaſs*; the various and intricate Deſcriptions whereof we will not inſiſt upon, but take our Obſervations from the moſt plain and ordinary ſingle Perpendicular-*Glaſs*, being only as follows.

Procure at the *Glass-house*, or elsewhere, a *Globular-glass*, with a Tube or Pipe thereto proportionable, whereof there are many sizes; but be sure let not the Head be too big, nor the Pipe too long, lest there be not rise enough in the Winter, or fall enough in the Summer. You must also have a small Glass or Vessel at the bottom, that may contain water enough to fill the Tube, or more.

Then having fixed them in some Frame made for that purpose, heat the Globe of the Glass with a warm Cloth, to rarifie the Air within it; and then put the end of the Tube into the lower Vessel, and it will attract the water more or less, as you warmed the Head.

You may also add numbers on the Glass, to shew you the degrees.

The water you may make blew with *Roman-Vitriol* boiled, or red with *Rose-leaves* dry, and imbibed in fair water, wherein a little *Oyl of Vitriol*, or *Spirit of Salt* is dropt. With this water fill the under-Vessel; which being rightly placed on the *North*-side of your house, where the Sun rarely or never shineth against it, and in a Room where you seldom make fire, lest the sudden access of heat, or accidental alteration of the Air, might impede your Observations.

The Air included within the Globe or Ball of this Glass, doth admit of Dilatation and Contraction equally with the Ambient Air, that whensoever the Ambient Air is dilated or expanded, either through the heat of the season, or before the fall of Rain, *&c.* the Air in the Glass is the same; and as by its Expansion it requires more room, so doth it let the water in the Tube descend gradually; and as it is more dense or contracted, either through the coldness of the season, or the serenity or inclinability to drought of the Ambient Air, so also doth the Air within the Glass contract it self into a less compass, and sucketh up the water in the Tube gradually, as it condenseth or contracteth: whence you may at any time exactly know the very degree of Rarity or Density of the Air Ambient, by that which is included in the Glass, and thereby inform your self what weather is most likely to succeed at any time.

Be sure to Quadrate or Contemporize your Observations or Numbers of Degrees with the season of the year; for that Degree of Rarity that signifies Rain in the Winter, may be such a Degree of Density that may signifie fair weather in the Summer.

The differences betwixt the highest rise and lowest fall in one day in the Summer, is much more than in the Winter; for you shall have a cold night, and very serene Air, which contracteth the Air in the Glass into a little Room; after which usually succeeds a very hot day, which dilateth it very much; when in the Winter no such great difference happens in one day.

Yet

Yet in the Winter, in ſeveral days, will the difference be as great as in ſeveral Summer-days.

Although the Air appear ſerene and cold to your Senſes, yet truſt not to that, if the Glaſs ſignifie otherwiſe.

We ſhall not give you any ſure Rule by which you may judge of the weather, but leave it to your own obſervations; that is, draw on a paper a certain number of lines, as many as you think fit, as Muſitians draw lines to prick their Tunes on; at the end whereof, as they place their Key, ſo number your lines according to thoſe numbers that are next unto the top of the water in the Tube of the Glaſs, whether ſeven, eight, nine, ten, eleven, twelve, *&c.* Over this Scale mark the day of the Month, and point of the winde: in the Scale make a dot or prick at what line or number the water in the Glaſs is at, and by it the hour of the day, and under it the inclination of the weather: At night draw a line downright like the Muſitians full time or note; the next day mark as before, until you know and underſtand the nature of your Glaſs, and the place it ſtands in, and the ſeaſon of the year: ſo that then you ſhall be able at any time to give a probable conjecture of whatſoever is to be known or ſignified by that Inſtrument, which otherwiſe you ſhall hardly do.

This new-invented Inſtrument, which is termed the *Baroſcope*, by which the Authors thereof pretend to diſcover the temper and inclination of the Air from its weight, (in brief) is thus deſcribed: Seal a Glaſs-tube Hermettically at the one end, fill it almoſt with Quickſilver, and invert it, reſting the open end in a Veſſel of Quickſilver; then the Quickſilver in the Tube, by its weight, preſſeth downwards into the Veſſel, and ſo diſtendeth or ſtreineth the Air (which is but little) remaining in the Glaſs, that the ſummity of the Tube is for a ſmall ſpace void of Quickſilver, ſo far as that ſmall portion or remainder of Air is capable of diſtention; which is much more by Quickſilver, the moſt ponderous of Fluid Bodies, than by water in the *Weather-glaſs*. But they pretend that this Column of Quickſilver in the Tube, is ſupported by the weight of the Air Ambient, preſſing on the ſtagnant Quickſilver in the Veſſel; and that as the Air becomes more or leſs ponderous, ſo doth the Quickſilver in the Tube riſe or fall more or leſs accordingly: which if it were true, then in caſe the ſtagnant Quickſilver were broader in a broader Veſſel, would the greater quantity of Air preſs harder upon it, and the Quickſilver in the Tube riſe higher; but it doth not. Alſo if the Quickſilver in the Tube were ſupported by the preſſure or weight of the Air on the ſtagnant Quickſilver in the Veſſel, then would not the Quickſilver deſcend by the making of ſome ſmall hole on the top of the Tube, which we evidently perceive to do.

Of the Baroſcope.

Alſo when the Air is moſt rare, and by conſequence leſs ponderous, (if any weight thereof ſhould be ſuppoſed) then will the Column of Quickſilver in the Tube be higher; and when the Air is more denſe or burdened with moiſture, then will

will it be lower: The contrary whereof would happen, if their *Hypotheſis* were true.

But moſt evident it is, that as the Ambient Air becomes more or leſs rare or denſe, ſo doth the Air in the Tube contract or dilate it ſelf; which is the ſole cauſe of the riſe or fall of the Quickſilver.

Much more might be ſaid herein, and alſo of the *Weather-glaſs* or *Thermoſcope*; but I hope this may ſuffice to induct inquiſitive, and not exact or perfect Artiſts: The full diſcourſe and diſcovery of the various effects, obſervations and concluſions of theſe Inſtruments, requiring rather a Tract peculiar and proper for them only.

There is alſo another Inſtrument that may be made more exact for any of the aforeſaid obſervations or intentions, and fit for further diſcoveries; but my occaſions will not at preſent give me leave to perfect it.

SECT. II.

Of Obſervations and Prognoſticks taken from the Earth and Water.

Of the Earth. If the Earth appear more dry than ordinary, or if it greedily drink in Rains lately fallen, or Floods ſuddenly abate, it ſignifies more Rain to follow.

If the Earth, or any moiſt or Fenny places yield any extraordinary ſcents or ſmells, it preſageth Rain.

Of the Water. If the Water, being formerly very clear, change to be dim or thick, it ſignifies Rain.

If Dews lie long in a morning on the Graſs, *&c.* it ſignifies fair weather, the Air then being more ſerene, and not of an attractive or ſpungy nature.

If Dews riſe or vaniſh ſuddenly and early in the morning, it preſages Rain.

If Marble-ſtones, Metals, *&c.* appear moiſt, it indicates the inclination of the Air to be moiſt, and ſubject to Rain.

But if in a morning a Dew be on the Glaſs in the window, and on the inſide, it ſignifies a ſerene and cool Air, and inclinable to drought.

Of the Sea. If the Sea appear very calm with a murmuring noiſe, it ſignifies winde.

If on the ſurface of the Sea you diſcern white Froth like unto Crowns or Bracelets, it ſignifies winde; and the more plainly they appear, the greater will the Winde and Tempeſts be.

If the waves ſwell without winds, or the Tide riſe higher, or come aſhore more ſwift than uſual, it preſageth windes.

SECT. III.

Of Obſervations and Prognoſticks taken from Beaſts.

It is a thing worthy of admiration and conſideration, how the Beaſts of the Field, Fowls of the Air, *&c.* ſhould be capable of ſo great a degree of knowledge and underſtanding, as to foreſee the different changes and varieties of ſeaſons; and not from common obſervations, as man doth, but from a certain inſtinct of Nature, as is moſt evident.

Several ſignifications of the change of weather are taken from the different poſtures of theſe Beaſts; as, if they lie on their right ſide, or look towards the *South*, or look upwards, as though they would ſnuff up the *Air*; according to the *Poet*: *Of Beeves or Kine, &c.*

Mollipedeſque Boves ſpectantes lumina Cœli,
Naribus humiferum duxere ex Aere Succum. Cicero.

Or if they eat more than ordinary, or lick their Hoofs all about,

Convenit inſtantes prænoſcere protinus Imbres, Avien.

Rain follows forthwith.

If they run to and fro more than ordinary, flinging and kicking, and extending their Tails, Tempeſts uſually follow.

If the Bull leadeth the Herd, and will not ſuffer any of them to go before him, it preſageth Winde and Rain.

If Sheep feed more than ordinary, it ſignifies Rain; or if the Rams skip up and down, and eat greedily. *Of Sheep.*

If Kids leap or ſtand upright, or gather together in Flocks or Herds, and feed near together, it preſageth Rain. *Of Kids.*

If the Aſs bray more than ordinary, or without any other apparent cauſe, it preſageth Rain or windes. *Of Aſſes.*

If Dogs howl, or dig holes in the earth, or ſcrape at the walls of the houſe, *&c.* more than uſual, they thereby preſage death to ſome perſon in that houſe, if ſick; or at leaſt tempeſtuous weather to ſucceed. *Of Dogs.*

If the hair of dogs ſmell ſtronger than uſual, or their guts tumble and make a noiſe, it preſageth Rain or Snow; or they tumble up and down.

The Cat by waſhing her face, and putting her foot over her Ear, foreſhews Rain. *Of Cats.*

It hath been anciently obſerved, that before the fall of a houſe, the Mice and Rats have forſaken it. *Of Mice and Rats.*

The ſqueeking and skipping up and down of Mice and Rats, portend Rain.

----- Parvi cum ſtridunt denique Mures,
Cum geſtire ſolo, cum ludere ſorte videntur,
Portendunt craſſo conſurgere Nubila Cœlo. Avien.

Of

Of Swine. Of all Creatures, the Swine is moſt troubled againſt winde or Tempeſts, which makes Countrymen think that only they ſee the winde.

They uſually ſhake Straw in their mouths againſt Rain: As *Virgil:*

----- Ore ſolutus
Immundi meminere ſues jactare Maniplos:

If they play much, it ſignifies the ſame.

SECT. IV.

Of Obſervations and Prognoſticks taken from Fowl.

Of water-fowl. As Beaſts, ſo have Birds a certain fore-ſight of the change of weather, and alteration of the ſeaſons, and eſpecially Water-fowl; which if they fly or gather together in great flights, and from the Sea or great waters haſten to the banks or ſhore, and there ſport themſelves, it denotes windes; more eſpecially if in the morning.

If the Breaſt-bone of a Duck be red, it ſignifies a long Winter; if white, the contrary.

Ducks and Geeſe, *&c.* picking their wings, waſhing themſelves much, or Cackling much, ſignifies Rain.

Alſo Sea-fowl ſeeking after freſh waters, ſignifie an open or wet ſeaſon.

Virgil. *Jam varias Pelagi volucres, & quæ----*
Dulcibus in ſtagnis rimantur, &c.

If they betake themſelves to great waters, it preſageth cold; if *Water-fowl* forſake the water, it ſignifies that *Winter* is at hand.

Of Land-fowl. If *Land-fowl* gather towards the water, and ſhake their wings, making noiſes, and waſhing themſelves, it portendeth Tempeſts at hand.

If ſmall Birds gather together in Flocks, it ſignifies cold and hard weather at hand.

If Birds ſeek ſhelter in Barns or houſes more than uſual, it preſages cold and hard weather.

If Birds fly haſtily to their Neſts, and forſake their meat, it foreſheweth Tempeſts.

If in froſty weather Birds ſeek obſcure places, and ſeem dull and heavy, it ſignifieth a ſudden Thaw.

The early appearance of Field-fares, or other forreign Winter-fowl, preſageth a hard Winter.

Rooks, Owls, Jays, or ſuchlike wilde Fowl, frequenting a Town more than uſual, preſage Mortality or Sickneſs to that place.

Of the Heron. If the *Heron* ſoar high, ſeemingly even to the Clouds, it ſignifies winde.

If

If the *Heron* stand melancholy on the Banks, it signifies Rain.

If the *Heron* cry in the night as she flies, it presageth Winde.

If the *Kite* soar high, it signifies fair weather. *Of the Kite.*

If they make more than ordinary noise or crying for Prey, it presageth Rain.

If the *Crow* hath any interruption in her Note, like the Hiccough, or Croak with a kinde of swallowing, it signifieth Winds and Rain. *Of the Crow.*

Rooks or *Crows* gathering together in Flocks, and forsaking their Meat, signifie Rain.

The *Raven* or *Crow* Creeking clear, and reiterating her Note, signifies fair weather.

If Sparrows chirp earlier, or more than usual, it signifies Winde and Rain. *Of Sparrows.*

If Jays gather together in Flocks, it signifies Rain and tempestuous weather. *Of the Jay.*

If Bats fly abroad after Sun-set, it signifies fair weather. *Of Bats.*

If Owls whoop at night, it signifies fair weather. *Of the Owl.*

The early singing of the Wood-lark, signifies Rain. *Of the Wood-lark.*

If the Swallow fly low, and near the waters, it presageth Rain. The coming of the Swallow is a true presage of the Spring. *Of the Swallow.*

If Cocks crow more than ordinary, especially in the Evening, or if Poultry go early to Roost, it signifies Rain. *Of the Cock.*

Sect. V.

Of Observations and Prognosticks from Fishes and Insects.

If *Porpises*, or other Sea-fish leap in a calm, it signifies Winde and Rain. *Of Sea-Fish.*

If great numbers of the Fry of Fish are generated in Lakes or Ditches where Fish rarely come, it presageth great scarcity of Corn, or death of Cattle. *Of Fresh-water Fish.*

If Fish leap more than ordinary in Ponds or Rivers, it presageth Windes and Rain.

Great quantities of Frogs, small or great, appearing at unusual times, and in unusual places, presage great Dearth of Corn, or great Sicknesses to follow in that place where they appear. *Of Frogs.*

The Croaking of Frogs more than usual in the Evening, signifies Rain.

The early appearing of Snakes, signifies a dry Spring, and a hot Summer. *Of Snakes.*

If they play much in the water, it signifies Rain.

If the Ant brings forth her Eggs, it presageth Rain. *Of Ants.*

If Bees fly not far, but hover about home, it presageth Rain; or if they make more haste home than ordinary, a Storm is at hand. *Of Bees.*

If Gnats, Flies or Fleas bite more keenly than at other times, it signifies Rain. *Of Gnats, Flies and Fleas.*

If Gnats or Flies swarm or gather together in multitudes before Sun-set, it presageth fair weather.

Swarms of Gnats or Flies in the morning, signifie Rain.

If great numbers of them appear more than ordinary, it signifieth Sickness or Mortality to Man or Beast, and also scarcity of Corn and Fruits.

The early appearance of these, or any other Insects in the Spring, presageth a hot and sickly Summer.

Of Spiders. If the Spiders undo their Webs, Tempests follow.

Avien. *Si solvit Aranea casses,*
Mox tempestates & nubila tetra cientur.

If Spiders fall from their Webs, or from the walls, it signifies Rain.

If strings like Spiders Webs appear in the Air, it signifieth Winde.

If Spiders spin and weave their Nets much, it presageth Winde.

Chaffers, &c. The great appearances of Chaffers, or other Insects, although they denote a present time of Plenty, yet are they Omens of a future time of Scarcity; and if in very great numbers, of Mortality and Sickness to Man and Beast.

SECT. VI.

Promiscuous Observations and Prognosticks.

Of Trees and Vegetables. Leaves of Trees and Chaff playing or moving without any sensible Gale or Breath of Winde, and the Down or Wooll of Thistles and other Plants flying in the Air, and Feathers dancing on the water, presage Winde, and sometimes Rain.

If the Herb *Trefoyl* close its leaves, it foreshews Rain.

If the Oak bear much Mast, it foreshews a long and hard *Winter.*

If Oak-apples ingender or breed Flies, it is said to presage Plenty; but if Spiders, Scarcity.

If Trees bear but little Fruit, it usually presageth Plenty; and if much, Scarcity. But this Rule is not always certain.

If the Broom be full of Flowers, it usually signifies Plenty.

The sudden growth of Mushrooms presageth Rain.

Avienus. *Et si nocturnis ardentibus undique testis*
Concrescunt fungi-----protinus Imbres.

Of Fire. If Coals of Fire shine very clear, it presageth Winde.

If the Fire in Chimneys burn whiter than usual, and with a murmuring noise, it denoteth Tempests.

If the Flame wave to and fro, it signifieth Winde. The same doth the Flame of a Candle.

----- *Si flammis emicet ignis* Avienus.
Efflnus, aut lucis ſubſtantia langueat ultro,
----- *Protinus Imbres.*

If Bunches like *Muſhrooms* grow on the wick of the Candle or Lamp, it preſageth Rain.

If fire ſhine much, or ſcald, or burn more than ordinary, it preſageth cold: the contrary denoteth the contrary.

If Wood crackle or breath more than uſual in the fire, it ſignifieth winde: If Flame caſt forth many ſparkles, it ſignifies the ſame.

If the Oyl in the Lamps ſparkle, it ſignifies Rain.

If Aſhes coagulate or grow in lumps, it ſignifies the ſame.

If the Fire in cold weather burn violently, and make a noiſe like the treading of Snow, it uſually preſageth Snow.

If Salt become moiſt, it ſignifies Rain: The ſame if the Rain raiſe bubbles as it falls, or if the heat of the Sun be more than ordinary, or Worms come out of the Earth, or Moles dig more than uſual. *Signs of Rain.*

If after Rain comes a cold winde, it ſignifies more Rain.

If in time of great cold the Air grow thick, and the cold abate, or if there be a dry cold without Froſt, or if there appear ſigns of Cold in ſigns of Rain, it preſageth Snow. *Signs of Snow.*

It is uſual that a dry *Autumn* precedes a windy *Winter*; a windy *Winter*, a rainy *Spring*; a rainy *Spring*, a dry *Summer*; a dry *Summer*, a windy *Autumn*.

It is obſerved, that how far the Froſt penetrates the Earth in the *Winter*, the heat ſhall in the *Summer*.

Many are of opinion that the Air and time of the Moon is to be conſidered in ſeveral Rural Affairs: As that the Increaſe is the moſt fit and beſt time for the killing of Beaſts; and that young Cattle fallen in the Increaſe are fitteſt to wean; and that it is the beſt time to plant Vines, and other Fruit-trees; to graft and to prune lean Trees, and cut Wood; to ſow Herbs, and gather Tillage, and cut Meadows. *Increaſe of the Moon.*

That at the Full-Moon it is beſt to fly Hawks, take Marrow, and take Shell-fiſh, *&c.* *Full.*

That at the Decreaſe it is beſt to geld young Cattle, to fell durable Timber, to gather Fruits, ſow and cut Corn, and lay up Corn; to prune groſs Trees, to gather Grafts and Seeds, and to ſow Cucumbers, Melons, Onions, and Artichoaks. *Decreaſe.*

10 JY 57

Dictionarium Ruſticum;

OR, THE

INTERPRETATIONS

AND

SIGNIFICATIONS

OF SEVERAL

RUSTICK TERMS

Uſed in ſeveral places of

ENGLAND:

And alſo the Names of ſeveral

INSTRUMENTS and MATERIALS

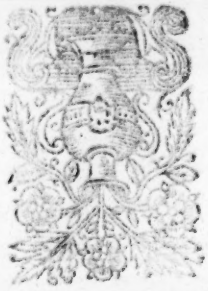
Uſed in this

MYSTERY of *AGRICULTURE*;

And other Intricate Expreſſions diſperſed in our

Rural Authors.

London: Printed in the Year 1675.



ENGLAND.

TO THE READER.

THis Dictionary, *above any other part of this Book, may be thought ſuperfluous, becauſe it being intended only for the uſe of* Husbandmen, *they above all others beſt underſtand the Terms, and their ſeveral Significations; ſo that herein we ſeem to inſtruct thoſe that are beſt able to teach us; which might be true, if they all ſpake the ſame Language: But there is ſuch a* Babel *of Confuſion, as well in their Terms and Names of things, as there is in the Practice of the* Art of Agriculture *it ſelf, that remove a* Husbandman *but ſixty or an hundred Miles from the place where he hath conſtantly exerciſed his* Husbandry *to another, and he ſhall not only admire their Method and Order in Tilling the Land, but alſo at their ſtrange and uncouth Language and Terms, by which they name their ſeveral* Utenſils, Inſtruments, *or* Materials *they uſe, ſo much differing from thoſe uſed in the Country where he dwells.*

Alſo our ſeveral Authors *that have written of this* Subject, *very much differ in the Appellation of ſeveral things, they generally ſpeaking in their Writings the* Language *of the* Place *and* Age *they lived in; that their Books read in another part of the Country, or in ſucceeding times, ſeem either Fabulous or Intricate. Wherefore, that our* Authors *and this preſent* Tract *may be the better underſtood, and alſo that one* Countryman *may underſtand what another means in a remote place; I have here given you the* Interpretation *and* Signification *of ſuch* VVords *and* Terms *that I remember I have either read or heard; which I hope may ſatisfie and ſupply that defect of ſuch a* Dictionary

that

that hath been so long complained of. If any Terms *are wanting, or not rightly Interpreted, I desire you to consider the place you live in, where perhaps may be some* Terms *used, or so Interpreted, that are not so in any other place of* England, *which may I hope sufficiently excuse my ignorance of them; or else they may be* Terms *so Universally understood, that they need no Interpretation; as* VVheat, Rye, Cart, VVaggon, *&c.*

DICTIO-

DICTIONARIUM RUSTICUM:

OR,

The INTERPRETATIONS & SIGNIFICATIONS

Of several

RUSTICK TERMS, *&c.*

A

Anes, or *Awnes*; the Spires or Beards of Barley, or other Bearded Grain.

Ablactation is one of the ways of Grafting; that is, weaning the Cion by degrees from its Mother; being not wholly to be cut therefrom, till it be firmly united to the Stock on which it is grafted.

Ablaqueation is the taking away the Earth, or uncovering the Roots of Trees.

An *Acre* is one hundred and sixty square Lug, or Perch of Land, at sixteen foot and a half to the Perch; but of Coppice-wood eighteen foot to the Perch is the usual allowance. But an *Acre* sometimes is estimated by the proportion of Seed used on it; and so varies, according to the richness or sterility of the Land.

An *Acreme* of Land is ten Acres.

A *Welsh Acre* is usually two English Acres.

An *Adds* is a sharp Tool made different from an Axe, and more convenient for the cutting of the hollow side of any Board or Timber; such as the Coopers generally make use of.

Agriculture, the Tilling or Improving of Land.

Alveary, a Hive of Bees.

Apiary, a place or Court where Bees are kept.

An *Aquaduct*, a Water-course, or Carriage for water.

Aquaticks, Plants delighting in the water.

To *Are*, to Plough.

Arders, Fallowings or Ploughings of Ground.

Aromaticks, Plants odoriferous, or having a Spicy smell.

Avenues, Ways or Passages, or Rows or Walks of Trees.

Aviary, a place where Birds are kept, or do resort unto.

Axletree, or *Axis*; that which the Wheel of a Cart, or such-like, moveth on.

B

Bag, the Udder of a Cow, in some places is called the *Cows-Bag*.

Balks, Ridges or Banks.

Barth, a warm place or Paſture for Calves or Lambs, *&c.*

Barrow, is of two ſorts; either a *Hand-barrow*, or a *Wheel-barrow.*

Barton, a Back-ſide.

Baven, Bruſh-faggots made with the Bruſh at length.

Beeſtings, the firſt Milk from the Cow after Calving.

Beetle, or *Boytle*, a wooden Inſtrument wherewith they drive VVedges, Piles, Stakes, *&c.*

Beverage, Drink, or mingled Drink.

A *Bill* is an Edg-tool at the end of a ſtale or a handle; if ſhort, then it is called a *Hand-bill*; if long, then a *Hedging-bill.*

A *Binn*, a place made of Boards to put Corn in.

Blaſt. Corn is ſaid to be blaſted when it is poor and thin in the Ear, with little Flour in it.

Blight. See *Mildew.*

Blith, Yielding Milk.

Bole, or *Boale*, the main body of a Tree.

Boot, neceſſary Timber or wood for neceſſary uſes; as *Plough-boot*, *Houſe-boot*, *Fire-boot*, &c.

Boreas, the North-eaſt winde.

Bow, an Oxe-bow, or Yoak.

Bragget, a Drink made with Honey and Spice, much uſed in *Wales.*

Brake, Fern.

Brank, *Buck*, or *French-wheat*; a Summer-grain, delighting in warm Land.

A *Breaſt-plough*, a ſort of Plough driven by main force with ones breaſt, commonly uſed in paring the Turf in Burn-baiting.

A *Breck* or *Brack*, a gap in a Hedge.

Brim. A Sow is ſaid to go to Brim when ſhe goes to the Boar.

To *Brite* or *bright* Barley, Wheat, and other Grain; and Hops are ſaid to Brite when they are over-ripe, and ſhatter.

Browſe or *brouce*, the tops of the branches of Trees that Cattle uſually feed on.

To *Burn-beat*, or *burn the Bait.* Vide *Denſhire.*

Bulchin, a Calf.

Bullimony, a mixture of ſeveral ſorts of Grain.

Buſhel; in ſome places it is taken for two Strike, or two Buſhels, and ſometimes for more.

C

A *Cartwright*, one that makes Carts, Waggons, *&c.*

To *Cave*, or *Chave*, is with a large Rake, or ſuchlike Inſtrument, to divide the greater from the leſſer; as the larger Chaff from the Corn or ſmaller Chaff. Alſo larger coals from the leſſer.

Ceres, the Goddeſs of Corn, Seeds and Tillage: Alſo the Title of one of the Books of Mr. *Rea*, treating of Seeds.

Chaff, the Refuſe or Duſt in winnowing of Corn.

Champion, Lands not incloſed, or large Fields, Downs, or places without Woods or Hedges.

Cheeſe-

Cheeſe-lip, the Bag wherein Houſewifes prepare and keep their Runnet or Rennet for their Cheeſe.

Chitting, the Seed is ſaid to chit when it ſhoots firſt its ſmall root in the Earth.

Cider or *Cyder*, a Drink made of the juyce of Apples.

A *Ciderift*, one that deals in Cider, or an Affector of Cider.

Clogs, pieces of wood, or ſuchlike, faſtened about the Necks, or to the Legs of Beaſts, that they run not away.

A *Cock*, is of Hay or Corn laid on heaps to preſerve it againſt the extremities of the weather.

Codware, ſuch Seed or Grain that is contained in Cods; as Peaſe, Beans, *&c.*

A *Coleſire*, is a parcel of Fire-wood ſet up for ſale or uſe, containing when it is burnt a Load of Coals.

Collers about the Cattles Necks, by the ſtrength whereof they draw.

Come, The ſmall Fibres, or Tails of Malt.

Compas, or *Compoſt*, Soyl for Land, Trees, *&c.*

Coniferous Trees, are ſuch that bear Cones or Clogs, as the Fir, Pine, *&c.*

A *Conſervatory*, a place to keep Plants, Fruits, *&c.* in.

A *Coom*, four Buſhels.

Coppice, *Copiſe*, or *Copſe*, The ſmaller ſort of wood, or *Underwood.*

A *Cord* of wood is ſet out as the Coalfire, and contains by meaſure four foot in breadth, four foot in height, and eight foot in length.

Covert, a ſhady place for Beaſts.

A *Cradle*, is a frame of wood fixed to a Sythe for the mowing of Corn, and cauſes it to be laid the better in ſwarth; and it is then called a *Cradle-Sythe.*

A *Cratch*, a Rack for Hay or Straw. Vide *Rack.*

A *Croft*, a ſmall Incloſure.

Crones, old Eaws.

A *Crotch*, the forked part of a Tree, uſeful in many caſes of Huſbandry.

A *Crow*, or *Crome* of Iron; an Iron-bar with one end flat.

To *Cultivate*, to Till.

Culture, Tilling.

A *Curry-comb*, an Iron-comb wherewith they kemb Horſes.

A *Curtilage*, a Gate-room or Back-ſide.

A *Cyon*, a young Tree or Slip ſpringing from an old.

D

Dallops, a term uſed in ſome places for Patches or corners of Graſs or Weeds among the Corn.

Darnel, Cockle-weed, injurious to Corn.

To *Denſhire*, is to cut off the Turf of Land; and when it is dry, to lay it on heaps and burn it.

To *Delve*, to dig.

A *Diqble*, an Inſtrument wherewith they make holes for the ſetting of Beans, *&c.*

A *Dike*, a Ditch.

Dredge, Oats and Barley mixed.

Drought, a long time of dry weather.

Dug of a Cow; that is, the Cows Teat.

A *Dung-fork* is a Tool of three Tines or Pikes, for the better caſting of Dung.

E

TO *Ear* or *Are*, to Plough or Fallow.

Earning, Runnet wherewith they convert Milk into Cheeſe.

Eddiſh, *Eadiſh*, *Etch*, or *Eegraſs*, the latter Paſture, or Graſs that comes after Mowing or Reaping.

To *Edge*, to Harrow.

Edifice, Building.

Egiſtments, Cattle taken in to graze, or be fed by the Week or Month.

Eſpaliers, Trees planted in a curious order againſt a Frame, for the bounding of Walks, Borders, *&c.*

Exoticks, Forreign Plants, not growing naturally in our Engliſh Soyl.

F

TO *Fallow*, To prepare Land by Ploughing, long before it be ploughed for Seed. Thus may you fallow, twifallow, and trifallow; that is, once, twice or thrice Plough it before the Seed-time.

A *Fan* is an Inſtrument that by its motion Artificially cauſeth Winde; uſeful in the winnowing of Corn.

A *Farding Land*, or *Farundale of Land*, is the fourth part of an Acre.

A *Fathom* of Wood, is a parcel of Wood ſet out, ſix whereof make a Coal-fire.

To *Faulter*. Thraſhers are ſaid to faulter, when they thraſh or beat over the Corn again.

To *Ferment*; that is, to cauſe Beer, Cider, or other Drinks to work, that the dregs or impurities may be ſeparated upwards or downwards.

Fermentation, ſuch working.

Fertile, Fruitful.

Fertility, Fruitfulneſs.

Fetters are uſually made of Iron, and hanged about the legs of Cattle, that they leap not, or run away.

Fewel, any combuſtible matter wherewith a fire is made.

Filly, a She-colt.

Fimble Hemp, that is the yellow early Hemp.

Flayl, a thraſhing Inſtrument.

Floating, or drowning, or watering of Meadows: Alſo *Floating* of a Cheeſe, is the ſeparating the Whey from the Curd.

Flora,

Flora, the Goddess of Flowers. Also the Title of Mr. *Rea* his Excellent Treatise of Flowers.
Fodder, Hay, Straw, or such like food for Cattle.
Foison, plenty of Riches.
Foisty, Musty.
Fork. There are several sorts of them; some of Wood, some of Iron; some for Hay, others for Corn, *&c.*
To *Foyl*, That is, to fallow Land in the Summer, or Autumn.
Fragrant, Smelling pleasantly.
Frith, Underwood, or the shroud of Trees.
A *Frower*, An Edg-tool used in cleaving Lath.
Furrow, The low fall or drain in Land, either left by the Plough, or otherwise made.

G

A *Gap*, An open place in a Hedge, or suchlike.
A *Garner*, A Granary to put Corn in.
Georgicks, Belonging to Husbandry or Tillage; as *Virgil's Georgicks*, his Books of Husbandry.
Germins, Young shoots of Trees.
Germination, A budding forth.
Glandiferous, Bearing Mast.
To *Glean*, To pick up or gather the shattered Corn.
A *Goad*, A small staff or rod with a sharp Iron-pin at the end thereof, to quicken Horses or Oxen in their motion.
A *Geoff*, or *Goffe*, A Mow or Reek of Corn.
To *Gore*, To make up such Mows or Reeks.
Gosse, or *Gorse*, Furzes.
Groats, Oats after the Hulls are off, or great Oatmeal.
Grubbage. See Mattock.

H

TO *Hale*, or *Haul*, To draw.
Harneys, Ropes, Collers, and other Accoutrements fitted to Horses, or other Beasts, for their drawing.
Hatches, Flood-gates placed in the water to obstruct its current.
Haws, the Fruit of the White-thorn.
Hawm, The stalks of Pease, Beans, or suchlike.
Head-land, That which is ploughed overthwart at the ends of the other Lands.
Heckle, An Instrument used in the trimming and perfecting of Hemp and Flax for the Spinner, by dividing the Tow or Hurds from the Tare.
Helm, Is Wheat or Rye-straw unbruised by thrashing or otherwise, and bound in bundles for Thatching.
Heps, The Fruit of the Black-thorn.
Herbage, The Feeding, Grazing, or Mowing of Land.
Heyrs, Young Timber-trees that are usually left for Standils in the felling of Copses.
Hide-bound, A Disease whereunto Trees as well as Cattle are subject.

A *Hinde*, a Servant in Huſbandry.

Hillock, A little Hill, as a Hop-hill, *&c.*

Hogs, In ſome places Swine are ſo called; in ſome places young Weathers.

Hook, Land Tilled and Sown every year.

Hopper, Wherein they carry their Seed-corn at the time of Sowing: Alſo the Veſſel that contains the Corn at the top of the Mill.

How, An Inſtrument made like a Coopers Adds, for the cutting up of Weeds in Gardens, Fields, *&c.* and between Beans, Peaſe, *&c.*

Hovel, A mean Building or Hole for any ordinary uſe.

Hoven, Cheeſe that is raiſed or ſwelled up.

Hull, or *Hulls*, the Chaff of Corn.

Hurds of Flax or Hemp, are the worſer parts ſeparated from the Tare in the Heckling of it, whereby may be made Linnen-cloath.

Hutch, A Veſſel or Place to lay Grain, or ſuchlike thing in: Alſo a Trap made hollow for the taking of Weaſels, or ſuchlike Vermine alive.

Hut, A ſmall Hovel, or Cottage.

I

A *Jack*, A term ſometimes uſed for a Horſe whereon they ſaw Wood.

Iles, or *Oiles*. Vide *Aanes*.

An *Imp*, a young Tree.

Infertile, Barren.

Inoculation, The grafting or placing of the Bud of one Tree, into the ſtock or branch of another.

Irrigation, Watering of a Meadow, Garden, *&c.*

Irroration, A bedewing or beſprinkling of a Plant.

Junames, That is, Land ſown with the ſame Grain it was ſown with the precedent year.

Juter, A term by ſome uſed for the fertile coagulating ſaltiſh nature of the Earth.

K

Karle Hemp; That is, the latter green Hemp.

Kell, or *Kiln*, whereon they dry Malt or Hops.

L

Lattary, A Dairy-houſe.

Laire, *Layer*, or *Lieare*, Places where Cattle uſually repoſe themſelves under ſome ſhelter, the ground being inriched by their Soyl.

A *Lath*, a Barn.

Laund, or *Lawn* in a Park, Plain and untilled ground.

To *Leaſe*, or *Leaze*. *Vide* to *Glean*.

Lentils, A ſort of Grain leſs than Fitches.

Litter, Straw, or ſuchlike ſtuff for Cattle to lodge on.

To *Lock*, is a term uſed by Drivers in moving the Fore-wheels of a Waggon to and fro.

Log, A term uſed in ſome places for a cleft of Wood, in ſome places for a long Piece or Pole, by ſome for a ſmall Wand or Switch.

To *Lop*, To cut off the head-branches of a Tree.

A *Lug*. Vide *Perch*.

Lynchet, A certain line of Green-ſword or Bounds, dividing Arable Land in Common Fields.

M

Madr, a Diſeaſe in Sheep.

Manger, The place wherein beaſts eat Corn, or other ſhort Meat.

A *Maſh*, or *Meſh*; Ground-corn, or ſuchlike, boiled in water for Cattle to eat.

Maſt, The fruits of wilde Trees, as of Oaks, Beech, *&c.*

Mattock, A Tool wherewith they grub Roots of Trees, Weeds, *&c.* by ſome called a *Grub-axe*, or *Rooting-axe*.

Mature, Ripe.

A *Mayn-Comb*, wherewith they kemb Horſes Mayns.

A *Meak*, wherewith they Mow or Hack Peaſe, or Brake, *&c.*

Mere, The ſame as *Lynchet*.

Mildew, A certain Dew falling in the Months of *June* and *July*; which being of a Viſcous Nature, much impedes the growth or Maturation of Wheat, Hops, *&c.* unleſs a ſhowre of Rain waſh it off. It is alſo very ſweet; as appears by the Bees ſo mightily inriching their ſtores thereby.

Miſlen, or *Maſlen*; Corn mixed, as Wheat with Rye, *&c.*

Mogſhade, The ſhadows of Trees, or ſuchlike.

Mold, Earth.

Mounds, Banks or Bounds.

Muck, Dung or Soyl.

Murc, The Husks or Chaff of Fruits, out of which Wine or other Liquors is preſſed.

Muſt, The new Liquor or Preſſure of Fruits, before Fermentation.

N

Neat, A Heifer, or any of the kinde of Beeves.

A *Neat-herd*, A Keeper of Neat, Beeves or Cows.

A *Nurſery*, A place ſet apart for the raiſing of young Trees or Stocks.

O

Ollet, Fewel.

Olitory, An *Olitory*-garden is a Kitchen-garden, or a Garden of Herbs, Roots, *&c.* for food.

Oſt, *Ooſt*, or *Eeſt*; The ſame as Kell or Kiln.

P

P

A *Paddle-staff*; A long Staff with an Iron Bit at the end thereof, like a small Spade, much used by Mole-catchers.

A *Pail*, The same as a Bucket.

Pallisade; A sort of slight open Pale or Fence, set to beautifie a place or Walk.

Palms, The white Excrescencies of Buds of Sallies or Withy coming before the Leaf.

Pannage, The feeding of Swine or other Cattle on the Mast, or other Herbage, in Forrests, Woods, *&c.*

A *Pannel*, *Pad*, or *Pack-saddle*; Kindes of Saddles whereon they carry burthens on Horse-back.

Parterre, or *Partir*; A name proper to a Garden divided into Beds, Walks, and Borders for curious Flowers, Herbs, *&c.*

Pease-bolt, Pease-hawm, or Straw.

Pedware, Pulse.

Penstocks. See *Hatches*.

A *Perch*, or Lug, is sixteen foot and a half Land-measure, but is usually eighteen foot to measure Coppice-woods withal.

A *Pike*, A Fork or Prong of Iron.

A *Pile*, A parcel of Wood, two whereof make one Coal-fire.

A *Piscary*, A liberty of Fishing, or a place where Fishes are confined.

A *Pitch-fork*, or *Pick-fork*; the same with *Pike*.

A *Plough*, A term used in the Western parts for a Team of Horse or Oxen.

A *Plough-wright*, One that makes Ploughs.

Podds, The Cods or Shells of Cod-ware, or any other Seed.

Pollard, or *Pollinger*; An old Tree usually lopped.

To *Polt*, To beat or thrash.

Pomona, The Goddess of Fruits: Also the Title of several Treatises of Fruit-trees.

Pregnant, Full as a Bud, or Seed, or Kernel ready to sprout.

A *Prong*, The same as *Pike*.

To *Propagate*, To increase or multiply any thing.

A *Propagator*, A Planter.

To *Prune*, To trim Trees, by cutting off the superfluous Branches or Roots.

Puckets, Nests of Cater-pillars, or suchlike Vermine.

A *Puddock*, or *Purrock*; A small Inclosure.

Q

Quincunx, Is an order of planting Trees or Plants, that may be in order every way.

R

A *Rack*, A place made to contain Hay, or other Fodder, for Beasts to feed on.

To *Ree*, or *Ray*; To handle Corn in a Sieve, so as the chaffy or lighter part gather to one place.

Reed,

Reed, is either the long graſs that grows in Fens, or watery places, or Straw bound up for thatching, by ſome called *Helm*. See *Helm*.

A *Reek* of Corn, a Mowe or Heap of Corn, ſo laid for its preſervation out of any Barn.

A *Reek-ſtaval*, A frame of Wood placed on ſtones, on which ſuch Mowe is raiſed.

Reſinaceous, Roſeny, or yielding Roſin.

Rice, The ſhrouds or tops of Trees, or fellings of Coppices.

A *Ride* of Hazle, or ſuchlike Wood, is a whole plump of Sprigs or Frith growing out of the ſame Root.

The *Ridge*; The upper edge of a Bank, or other riſing Land.

A *Rock*; an Inſtrument generally uſed in ſome parts for the Spinning of Flax or Hemp.

A *Rod*. See *Perch*.

A *Roller* wherewith they roll Barley, or other Grain.

A *Rood*, a fourth part of an Acre.

Rough, The rough Coppice-wood, or Bruſhy-wood.

Rowen, Rough Paſture full of Stubble or Weeds.

Rudder, or *Ridder*, The wideſt ſort of Sieves for the ſeparating the Corn from the Chaff.

Runnet; A certain ſowre matter, made uſe of by Country-Houſewives for the Coming (or coagulation) of their Cheeſe.

Rural, Of, or belonging to the Country.

Ruſticities, Country-affairs.

Ruſtick, Country-like.

S

A *Seed-lop*, or *Seed-lip*; The Hopper or Veſſel wherein they carry their Seed at the time of Sowing.

A *Seminary*; a place where you ſow ſeeds for the raiſing of Trees or Plants.

To *Sew*, To drain Ponds, Ditches, *&c.*

Shake-time; The ſeaſon of the Year that Maſt and ſuch Fruits fall from T[illegible].

A *Shard*. Vide [illegible].

A *Shed*, a place erected and covered over for ſhelter for Cattle, or any other uſe, againſt a wall, or other Edifice.

To *Sheer*, is uſed in the Northern parts for to Reap.

Shock, Several ſheaves of Corn ſet together.

A *Shrape*, or *Scrape*; a place baited with Chaff, or Corn, to intice Birds.

To *Shroud*, To cut off the head-branches of a Tree.

A *Sickle*, a toothed Reap-hook.

A *Site*, or *Scite*; a principal Mannour, or Farm-houſe.

A *Skepe*, or *Scuttle*; a flat and broad Basket, made to carry Corn withal.

A *Skreyn* is an Instrument made of *Wire* on a Frame, for the dividing of Corn from *Dust*, *Cockle*, *Ray*, &c. Also it is usually made of *Lath* for the skreining of *Earth*, *Sand*, *Gravel*, &c.

Slab, The out-side sappy Plank or Board sawn off from the sides of Timber.

A *Sled*; a thing without Wheels, whereon to lay a Plough, or other ponderous thing to be drawn.

A *Sluce*, a Vent or Drain for water.

Sneed, or *Snead*; The handle of a Sythe, or suchlike Tool.

Sense, The Offal of Swine.

Soutage, Course Cloth, or bagging for Hops, or suchlike.

A *Spade*, or *Spitter*, wherewith they dig or delve: Also a *Cutting-Spade* wherewith they cut *Hay* or *Corn-Mowes*.

Stack of Corn. See *Reek*.

Staddles, *Standils*, or *Standards*; Trees reserved at the felling of Woods for growth for Timber.

Stail, The handle of a Tool.

Stale, a living Fowl, put in any place to allure other Fowl, where they may be taken.

Stercoration, Dunging.

Sterile, Barren.

Stover, Straw.

A *Strike* of Flax, so much as is heckled at one handful. Also it signifies an Instrument wherewith they strike Corn in the measuring. Also it is used in the Northern parts for a Measure containing about a Bushel.

Structures, Buildings.

A *Sturk*, a young Beeve, or Heifer.

A *Sty*, a place for fatting or keeping Swine.

Succulation, a Pruning of Trees.

Succulent, Juicy.

A *Sull*, a term used for a *Plough* in the Western parts.

A *Sull-paddle*, a small Spade-staff or Instrument to cleanse the Plough from the clogging Earth.

To *Summer-stir*, To fallow Land in the Summer.

A *Sussingle*; a large Girt that Carriers use to binde or fasten their Packs withal.

Sward. Ground is said to have a *Sward*, or to be swarded, when it is well grown or Coated over with Grass, or other Vegetables.

Swath, or *Swarth*; Grass, Corn, or suchlike, as it is laid by the Mower from the Sythe.

Swill, Used in the Northern parts for shade, or shadow.

To *Swingle* Flax, a term used by Flax-dressers.

A *Swine-herd*, a Keeper of Swine.

A *Sythe*, wherewith they Mow Grass or Corn.

T

Tare of Flax, the finest dresst part thereof ready for the Spinner.

Tares, A sort of Grain.

To *Ted*, To turn or spread new-mown Grass.

A *Teem*, or *Team*; A certain number of Horses, or other Beasts, for the Draught.

Terrasse, a Walk on a Bank or Bulwark.

Tet; The Cows Dug by some is called the *Tet*.

A *Threave* of Corn contains four Shocks, each Shock consisting of six Sheaves.

A *Tike*, a small Bullock or Heifer.

Tills, Lentils, a sort of Pulse.

Tylth, Soyl, or other improvement of Land.

The *Tine*, or Grain of a Fork.

Tits, Small Cattle.

A *Trendle*, a flat Vessel, by some called a *Kiver*.

A *Trough*, a Vessel to hold water, *&c.* to feed Cattle in, *&c.* or for the beating of Apples for Cider, or the like.

A *Trundle*, a thing made and set on low Wheels to draw heavy burdens on.

A *Trunchion*, a piece of Wood cut short like a Quarter-staff.

A *Tumbrel*, a Dung-cart.

V

A *Vat*, a Vessel to contain Beer, Ale, Cider, or any other Liquor in its preparation.

Vallor, or *Vallow*, or *Vate*; a Concave-Mold wherein a Cheese is pressed.

Vindemiation; The gathering of Grapes, or reaping the Fruit of any thing; as of Cherries, Apples, Bees, *&c.*

To *Vindemiate*, To gather the same Fruits.

Vinous, Winy.

Underwood; Coppice, or any other Wood that is not esteemed Timber.

Urry; The blew Clay that is digged out of the Coal-mines, and lies next the Coal, being crude and immature, and used for soyling of Land.

Utensils, Instruments used in any Art, especially Husbandry.

W

A *Wantey*. Vide *Sussingle*.

Wattell, The naked fleshie matter that hangs about a *Turkeys* head.

A *Weanel*, a young Beast newly weaned.

Whinnes, Furzes.

A *Wind-row*, Hay or Grass raked in Rows, in order to be set up in Cocks.

Winlace, or ***Winch***; that by which any burden is wound up, or drawn out of a Well, or other deep place.

To ***Winnow***, to separate by Winde the Corn from the Chaff.

To ***Winter-rig***, to fallow Land in the Winter.

Wood-land, Places where much Woods are; or it's generally taken for Countries inclosed.

Y

A ***Yate***, or ***Yatt***; A Gate.

A ***Yoak***, is either an Instrument for Oxen to draw by, or to put on Swine, or other unruly Creatures, to keep them from running through Hedges.

Z

Z ***Ephyrus***, The West-winde.

An ALPHABETICAL TABLE OF The Principal Matters before treated of.

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